ARJOHUNTLEIGH
GETINGE GROUP

Auto Logic 110
Auto Logic 175
Auto Logic 200
Auto Logic Autofirm
Aura Logic

Service Manual

CE
0086

...with people in mind

Service Bulletins Incorporated

Bulletin	Content	Date incorporated
SERB004	Autologic software VAB	Oct 2011
SERB005	Autologic software V1	Oct 2011
SERB014	Tubeset Assembly - change to spring and tubeset material	Oct 2011
SERB016	Communicator Software Restrictions	Mar 2012
SERB018	Addition of Test Port and Pressure Changes	Oct 2011
SERB020	Software Upgrade to V2.05	Oct 2011
SERB026	Change to Inflation Test Parameters	Oct 2011
SERB031	New AUTO Logic 175 mattress. Change to AUTO Logic 200 B-Pad	Oct 2011
SERB037	Introduction of new AUTO Logic PCB (630140)	Oct 2011
SERB049	Pump Front and Rear Case Part Changes	Oct 2011
SERB053	Battery Pack - Reset/Status Latch	Oct 2011
FSN001/ 2012/T&PP	Device Modification - Re-calibration of Pumps Pressure Transducer	Mar 2012
SERB064	Battery Pack - Serviceability Update	May 2013

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CHAPTER 1

INTRODUCTION

1 About This Manual

ArjoHuntleigh strongly recommend that their equipment is only serviced by trained personnel and provide courses for customers who wish to become licensed to service their own equipment. In no event will ArjoHuntleigh be responsible for any service performed by customers or third parties.

This manual contains information on maintenance, servicing, repair, troubleshooting and testing for the **Auto Logic® 110**, **Auto Logic® 175**, **Auto Logic® 200**, **Aura Logic® Auto Logic® Autofirm** and systems which comprise a pump and either a mattress overlay, mattress replacement or a seat cushion. You must read and understand this manual before attempting to service or repair the equipment.

In addition to the service details contained within this manual, service engineers should also ensure that any work is also in compliance with their national legislation relating to maintenance and repair of electrical medical devices.

Numbering and Cross-Referencing in this Manual

For all chapters in this manual:

- Chapter page numbering is continuous. Section and paragraph numbering re-start at “1” in each chapter.
- Page, figure and table numbering continue from the previous chapter.
- Cross-references which include a chapter number (and/or chapter title) refer to text in a different chapter. Cross-references which do NOT include any chapter number (or chapter title) refer to text within the same chapter.

Warnings, Cautions and Notes

WARNINGS given in this manual identify possible hazards in procedures or conditions which, if not correctly followed, could result in death, injury or other serious adverse reactions.

CAUTIONS given in this manual identify possible hazards in procedures or conditions which, if not correctly followed, could result in equipment failure or damage.

Notes given in this manual are used to explain or amplify a procedure or condition.

General Warnings

WARNING: BEFORE PERFORMING ANY SERVICE OR MAINTENANCE PROCEDURES, ENSURE THAT THE EQUIPMENT HAS BEEN ADEQUATELY DECONTAMINATED.

WARNING: VOLTAGES IN EXCESS OF 30 VOLTS RMS OR 50 VOLTS DC CAN, IN CERTAIN CIRCUMSTANCES, BE LETHAL. WHEN WORKING ON EQUIPMENT REQUIRING EXPOSURE TO LIVE, UNPROTECTED CONDUCTORS WHERE SUCH VOLTAGES ARE PRESENT, EXTREME CARE MUST BE EXERCISED.

WARNING: BEFORE DISMANTLING THE PUMP, MAKE SURE IT HAS BEEN ISOLATED FROM THE MAINS/POWER SUPPLY BY REMOVING THE MAINS/POWER PLUG FROM THE WALL SOCKET.

WARNING: STATIC SENSITIVE DEVICES. ELECTROSTATIC DISCHARGE CAN SERIOUSLY DAMAGE THE PCB ASSEMBLIES. THIS PUMP SHOULD ONLY BE OPENED BY PERSONNEL TRAINED IN ESD METHODS AND WITH APPROPRIATE EQUIPMENT AND ANTI-STATIC PROTECTION.

2 General

Regulatory

The **Auto Logic** system has been designed to comply with regulatory safety standards including:

- EN60601-1:1990/A13:1996 and IEC 60601-1:1988/A2:1995
- UL60601-1, UL2601-1 and CAN/CSA C22.2 No. 601.1-M90
- EN60601-1:2006 and IEC 60601-1:2005
- AAMI/ANSI ES60601-1:2006 and CAN/CSA C22.2 No.60601.1(2008)

Precautions

For your own safety and the safety of the equipment, always take the following precautions:

- Do not expose the system, especially the mattress, to naked flames, such as cigarettes, etc.
- Do not use or store the system in direct sunlight.
- Do not use phenol-based solutions to clean the system.
- Make sure the system is clean and dry before use or storage.
- Never use sharp objects or electrically heated under blankets on or under the system.
- Store the pump and mattress or seat cushion in protective bags.

Electromagnetic Compatibility (EMC)

This product complies with the requirements of applicable EMC Standards. Medical electrical equipment needs special precautions regarding EMC and needs to be installed in accordance with the following instructions:

- The use of accessories not specified by the manufacturer may result in increased emissions by, or decreased immunity of, the equipment, affecting its performance.
- Portable and mobile radio frequency (RF) communications equipment (e.g. mobile/cell phones) can affect medical electrical equipment.
- If this equipment needs to be used adjacent to other electrical equipment, normal operation must be confirmed before use.

Environmental Protection

Incorrect disposal of this equipment and its component parts, particularly batteries or other electrical components, may produce substances that are hazardous to the environment. To minimise these hazards, contact ArjoHuntleigh for information on correct disposal.

Design Policy and Copyright

® and ™ are trademarks belonging to the ArjoHuntleigh group of companies. As our policy is one of continuous improvement, we reserve the right to modify designs without prior notice.

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3 About the Auto Logic System

The **Auto Logic 110**, **Auto Logic 175**, **Auto Logic 200** and **Aura Logic** and **Auto Logic Autofirm** systems are automatic alternating pressure relief systems to aid the prevention, treatment and management of pressure ulcers:

- The **Auto Logic 110** system comprises a pump and a mattress overlay. The mattress overlay is designed to be placed on top of any standard mattress.
- The **Auto Logic 175** system comprises a pump and a mattress replacement. The mattress replacement is designed to replace the standard mattress on a bed, and comprises a mattress overlay on top of a foam mattress underlay. The mattress overlay is similar to that on the **Auto Logic 110** system, but has two extra zips to secure the mattress base pad to it.
- The **Auto Logic 200** system comprises a pump and a mattress replacement. The mattress replacement is designed to replace the standard mattress on a bed, and comprises a mattress

overlay on top of an air filled sub-mattress. The mattress overlay is similar to that on the **Auto Logic 110** system, but has two extra zips to secure the mattress base pad to it.

- The **Aura Logic** system comprises a pump and a seat cushion. The seat cushion is designed to be placed on top of any standard chair.
- The **Auto Logic Autofirm** is a standard Auto Logic with the addition of an 'Autofirm' function. Once activated, Autofirm creates a temporary firm surface to allow nursing procedures to be performed. Autofirm lasts 15 minutes, after which the pump will default back to the previous setting. The **Auto Logic Autofirm** runs the standard Auto Logic mattresses, which are as follows:
    - Auto Logic 110 Mattress Overlay
    - Auto Logic 175 Mattress Replacement
    - Auto Logic 200 Mattress Replacement

Note: ***Autofirm*** *will not function on the* ***Aura Logic*** *system.*

Note: *The* ***Auto Logic Autofirm*** *was originally a special pump variant restricted to certain markets, but the* ***Autofirm*** *function is now incorporated in all* ***Auto Logic 110****,* ***175*** *and* ***200*** *mattress systems.*

The difference between the Auto Logic and Auto Logic Autofirm are:

- Control PCB
- Software
- Pump Membrane Label

All systems are are designed to operate in either **Active (Alternating)** mode, which continuously changes the tissue pressure points providing a high degree of pressure relief, or **Reactive (Constant Lower Pressure) (CLP)** mode, which provides a constant lower pressure reduction and is used when a moving surface is contra-indicated for the patient.

Auto Logic Front and Rear Case Changes 2010

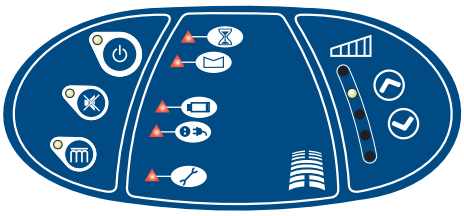
Note: *These variations do not apply to* **Auto Logic Autofirm** *which is made only with the new style case and unique membrane label.*

In 2010 the front case of the Auto Logic pump was updated. The rear case, while not changing internally also required an update, which has resulted in the updated pump casings **NOT** being compatible with the old pump cases. If replaced, the front and rear case parts must be replaced as a pair. Some illustrations in this manual show detail of the old pump casing, however where procedures are affected by the differences, they are highlighted and detailed accordingly.

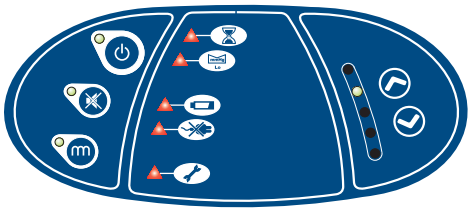
The quickest way to identify the case type is to look for the connector for the optional patient handset which is only fitted to the old style front case. The full list of differences between the old front case and the updated front case is below:

Table 1 - Front Case Differences

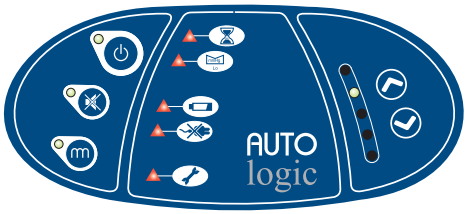
Applicable to 630320	Change Made to 630570
Patient Handset Grommet	Removed. (Handset no longer available).
Embossed Huntleigh “H”	Removed.
Recess support for Membrane label	This area is now a solid part of the new case Moulding (slot for membrane cable still exists).
Membrane Label: 630448 or LAB313 Note: If label replacement is required, always fit LAB392 (Refer to Figure 5).	Fitted with LAB402.
Strengthening Aid: 630399	No longer required with new case Moulding.
Insert Membrane Support: 630328	No longer required with new case Moulding.
Auto Logic Badge: 630398	ArjoHuntleigh Gel Pad Badge: PKG830.



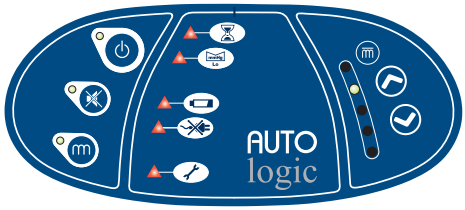
630448 (discontinued)
"H" Branding



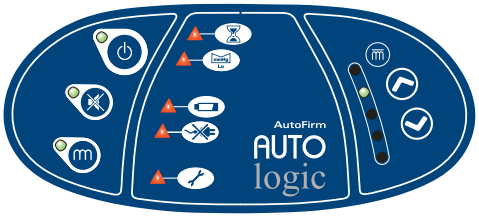
LAB313 (discontinued)
Plain



LAB392
"Auto logic" Branding without
Autofirm button



LAB402 (current)
"Auto Logic" Branding with
Autofirm button



LAB316 (discontinued)
Danish model with Autofirm button

Figure 1 - Auto Logic Membrane Label Differences

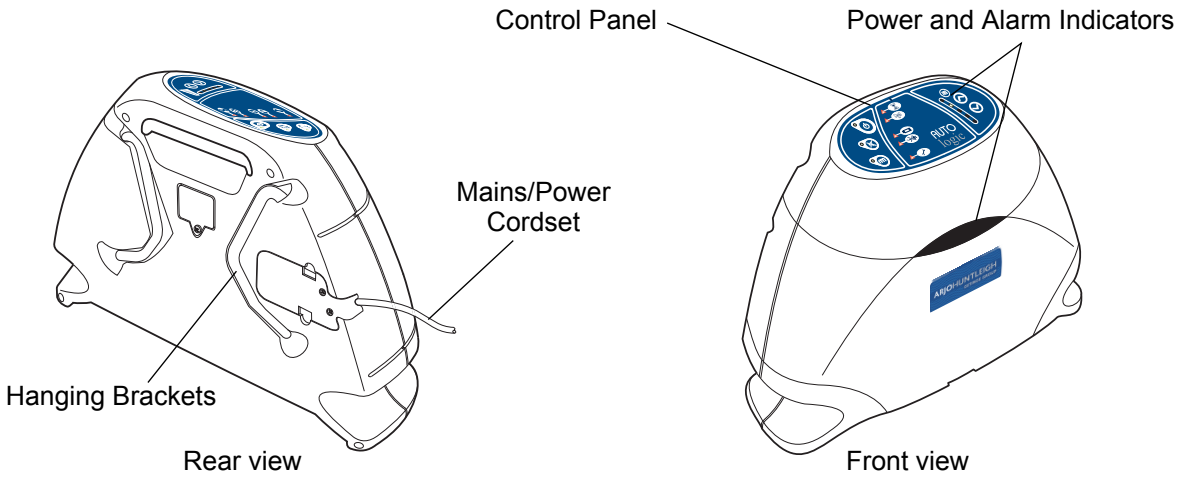


Figure 2 - Pump (new style case)

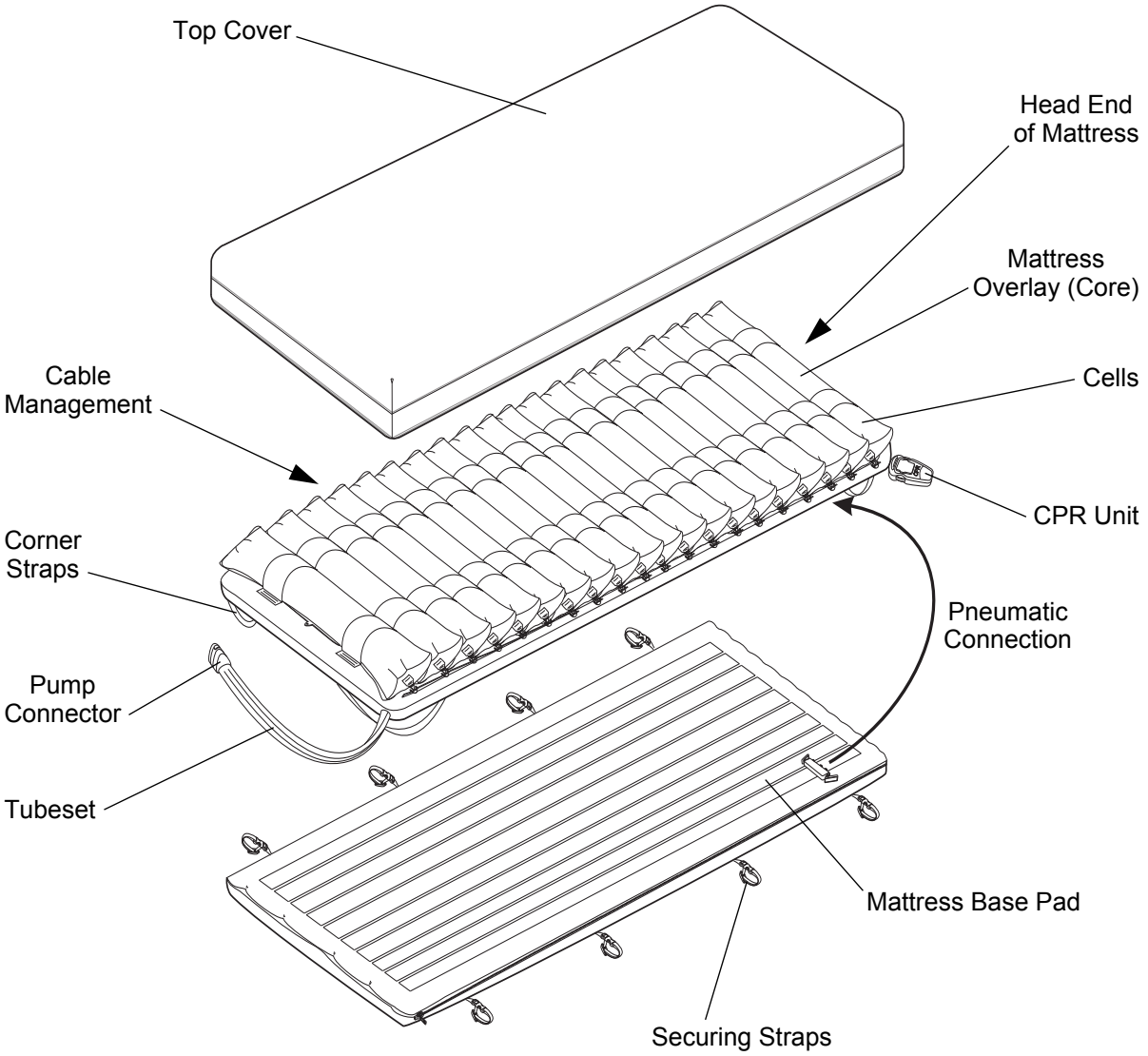


Figure 3 - Mattress Overlay and Replacement

Pump (Refer to Figure 2)

The pump provides a dynamic system of inflating the support surface underneath the patient, cycling every 10 minutes to produce periods of pressure relief for the whole body.

The single compressor pump has microprocessor-aided control and alarm functions, and has LED indications on the front case of the pump and the control panel on top of the pump.

An optional intelligent battery pack is available which allows the pump to be used independently of the mains/power supply. The battery pack slides onto the base of the pump, and recharges itself when the pump is operating from the mains/power supply.

A patient handset (no longer supplied) was previously available as an optional extra. Pumps with this facility are identifiable by a socket located on the left-hand side of the pump when viewed from the front. The handset gives the patient control over the comfort settings of the mattress and also allows them to mute the alarm.

The **Auto Logic** systems do not have a pressure sensor pad in the mattress. Instead, the pump incorporates Self Set Technology (SST), which adjusts the air pressure within the mattress every 10 minutes in **Active (Alternating)** mode and 20 minutes in **Reactive (Constant Lower Pressure) (CLP)** mode to suit the Body Mass Index (BMI) and position of the patient. Both support systems can be used on standard hospital and domestic beds.

Auto Logic 110 Mattress Overlay (Refer to Figure 3)

The mattress overlay comprises a mattress core of 20 individual cells which support the patient (Refer to Figure 4). 17 of the cells inflate alternately, and the remaining three are static cells to support the patient's head. The 10 light blue alternating cells in the centre of the mattress core incorporate two small cells at either end of the main cell. These "cells-in-cell" are kept at a constant pressure and help the transfer of patients on and off the bed by keeping the edges of the mattress firm. The remaining 10 cells (five at each end of the mattress) are dark blue.

The mattress core incorporates a low-air-loss patch under the cells to provide a constant bleed of air for additional patient comfort.

Should the patient experience cardiac arrest, a CPR (Cardio-Pulmonary Resuscitation) unit is positioned at the head end of the mattress core, to allow the mattress to rapidly deflate.

The mattress overlay is permanently connected to the pump via a 3-way tubeset. This tubeset has a 3-way pneumatic connection which incorporates a flexible, compact anti-kink tube which is resistant to crushing and any subsequent obstruction in air flow.

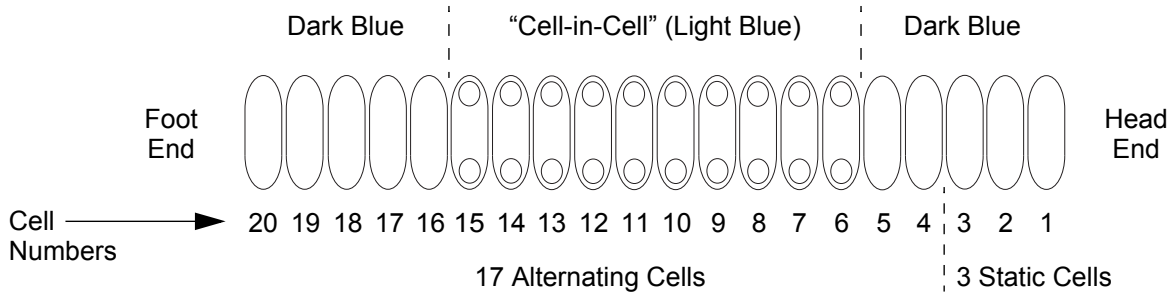

Dark Blue
"Cell-in-Cell" (Light Blue)
Dark Blue
Foot End
Head End
Cell Numbers
20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1
17 Alternating Cells
3 Static Cells

Figure 4 - Mattress Overlay Cell Numbering

To switch to transport mode, disconnect the tubeset from the pump. This will automatically seal the mattress so that air is not exhausted. It also cross-connects the cells to create an even pressure throughout. To resume normal operation, reconnect the tubeset to the pump.

The mattress overlay is enclosed in a polyurethane-coated fabric cover, with water-resistant, vapour permeable and two-way stretch properties. These assist with patient repositioning requirements and enhance comfort, while protecting the mattress interior from contamination. The overlay is simple to clean in situ, but can also be quickly unzipped and completely removed for thorough cleaning. The zips are protected by flaps to prevent the ingress of contaminants. The base cover for the mattress overlay has four adjustable corner retention straps which slide under the corners of the base mattress.

To keep the mains/power cable tidy and protect it from damage, a cable management flap secured by pop studs runs down the length of the mattress overlay, on the opposite side to the pump tubeset and CPR unit.

Auto Logic 175 & 200 Mattress Replacement (Refer to Figure 3)

The **Auto Logic 200** mattress replacement comprises a mattress overlay on top of an air filled sub-mattress. The mattress overlay is similar to the **Auto Logic 110 Mattress Overlay**, but has two extra zips to secure the air filled sub-mattress to it. There is also a pneumatic connection between the mattress overlay and the air filled sub-mattress. The base pad has eight adjustable straps on the underside to attach it to the bed frame.

The air filled sub-mattress comprises a main body zone and a perimeter cell zone. Both zones are fed directly from the air supply in the mattress overlay and are kept at a constant pressure. The main body zone is at the same static pressure as the head cells in the mattress overlay while the perimeter cell zone is at the higher static pressure of the cell-in-cells in the mattress overlay.

The air in the air filled sub-mattress is evacuated via the CPR unit in the mattress overlay, should a cardiac arrest occur.

The **Auto Logic 175** operates in the same way as the Auto Logic 200 above, however the air filled sub-mattress is replaced with a foam mattress underlay.

The mattress base pad also has a cable management flap secured by pop studs, on the opposite side to the pump tubeset and CPR unit.

Aura Logic Seat Cushion (Refer to Figure 5)

The seat cushion comprises seven alternating cells which are connected to the pump via a 2-way tubeset (there is no static feed in the seat cushion). The seven cells are manufactured as a single welded assembly, which is enclosed by a zipped cover. The base cover has two fixing straps to attach it to the chair.

There are two small dump valves on the underside of the base cover which are used to release the air inside the seat cushion in an emergency or for storage.

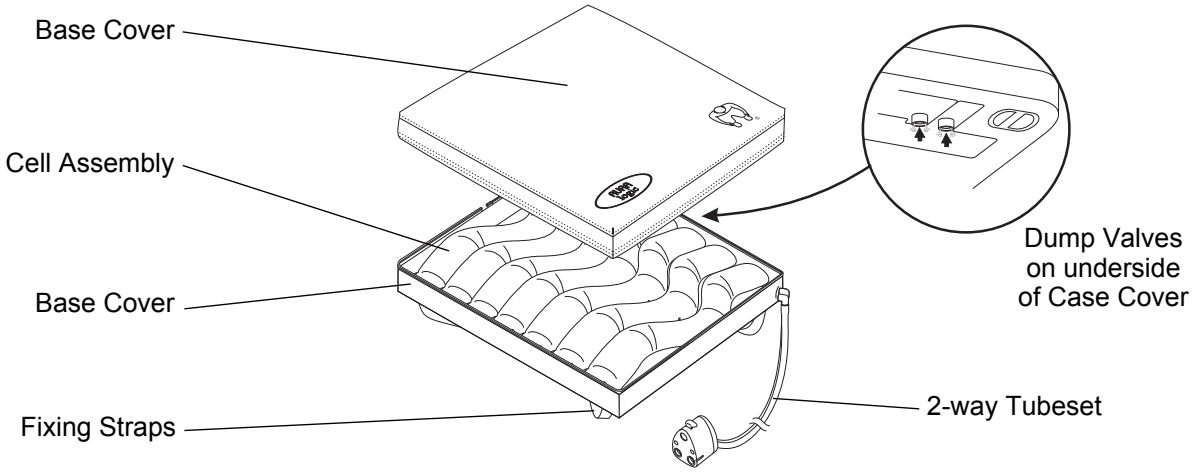


Figure 5 - Seat Cushion

Electric and Mattress Pneumatic Diagrams

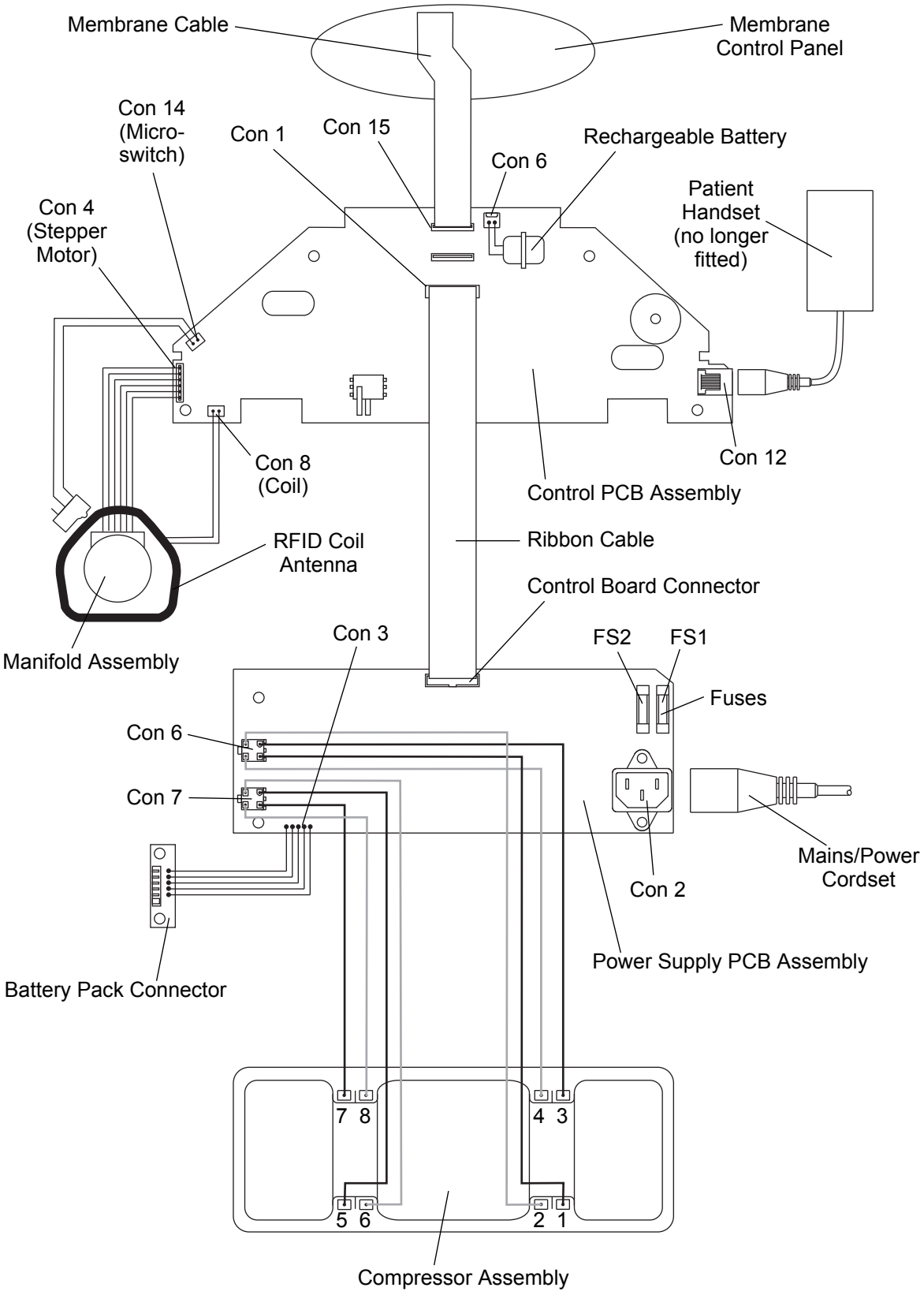


Figure 6 - Electrical Circuit Diagram

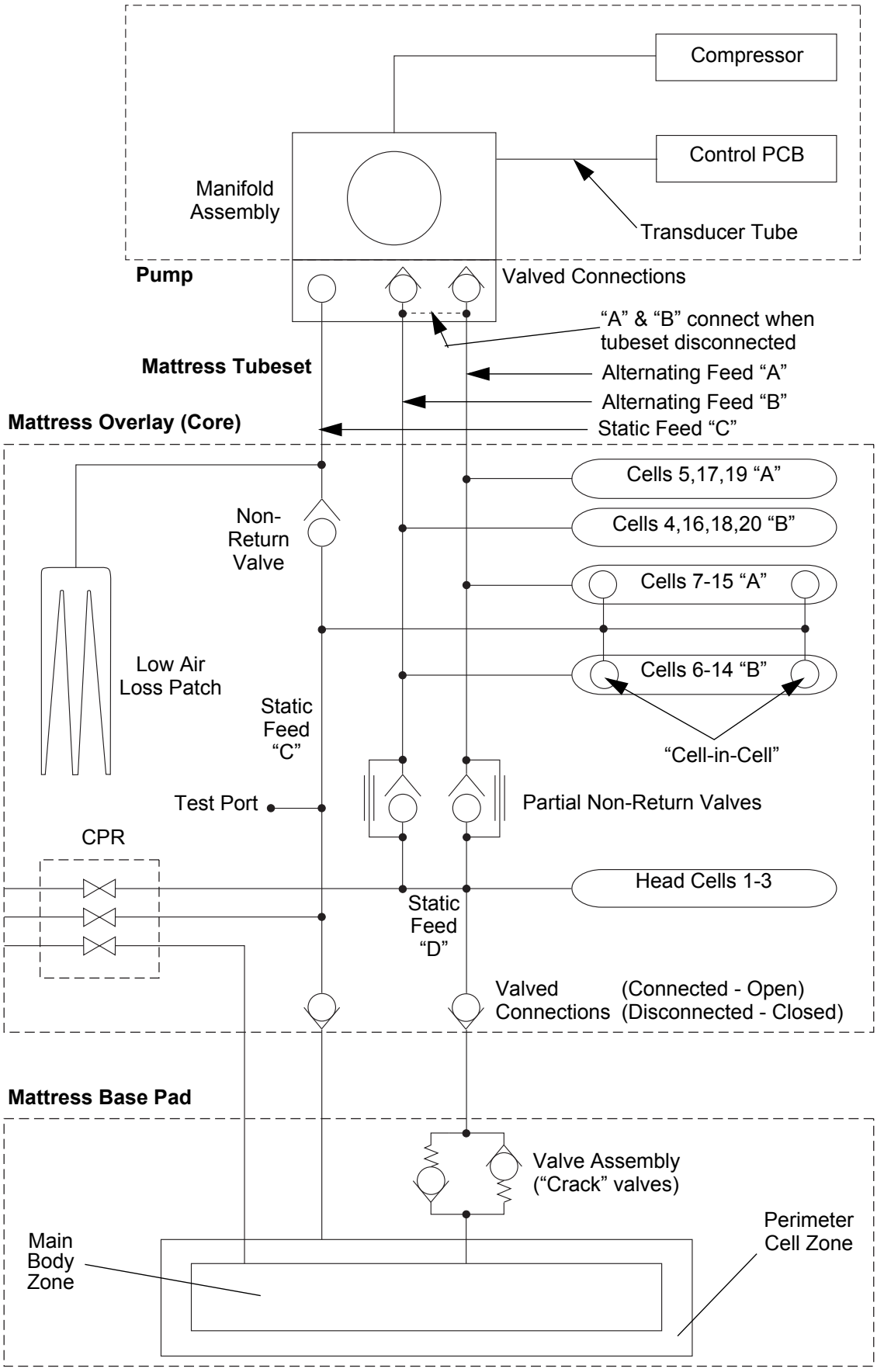


Figure 7 - Pneumatic Schematic for Pump and Mattress

4 Operating Principle

Pump

Refer to Figure 6 for the Electrical Schematic for the Pump.

Refer to Figure 7 for the Pneumatic Schematic for the Pump and Mattress.

Refer to Figure Note: for the Pneumatic Schematic for the Pump and Seat Cushion.

A single compressor in the pump provides a flow of air to the pneumatic system. The output of the compressor is fed to the manifold assembly, which also incorporates the rotary valve assembly. The rotary valve assembly channels air to different groups of cells in the mattress.

A tube from the manifold assembly is connected to a pressure transducer on the control printed circuit board (PCB). This provides the monitoring system with the means of accurately measuring the pressure of the air supply to the mattress.

The control PCB controls the compressor, the motor and manifold assembly, and the control panel on the top of the pump. It also performs a continuous check of the operation and performance of the pneumatic circuit. In the event of a detected fault, the electronic monitoring system generates both visual and audible alarms. The real time clock on the control PCB holds the time and date information.

The power supply PCB, in addition to generating the DC voltages for use in the pump, provides interfaces to the compressor and the optional battery pack.

There are three outputs from the manifold assembly to the tubeset connections (to the mattress):

- Alternating air feed “A”.
- Alternating air feed “B”.
- Static air feed “C”.

The distribution of air by the rotary valve in the manifold assembly is shown in Figure 8. The cells “A” and “B” in the mattress overlay core are inflated and deflated in a cycle period of ten minutes, as follows:

- Alternating 1: the “A” cells are inflated and the “B” cells are deflated.
- Static 2: brief crossover period where both “A” and “B” cells are inflated.
- Alternating 3: the “A” cells are deflated and the “B” cells are inflated.
- Static 4: pressure optimization cycle.
- Throughout the whole cycle (1-4) the static feed “C” is constant.
- During Autofirm (**Auto Logic Autofirm** only) mode, the rotor stator is in crossover position and all cells are inflated to a constant pressure. This mode of operation is initially up to 15 minutes but may be extended to 30 minutes by the user.

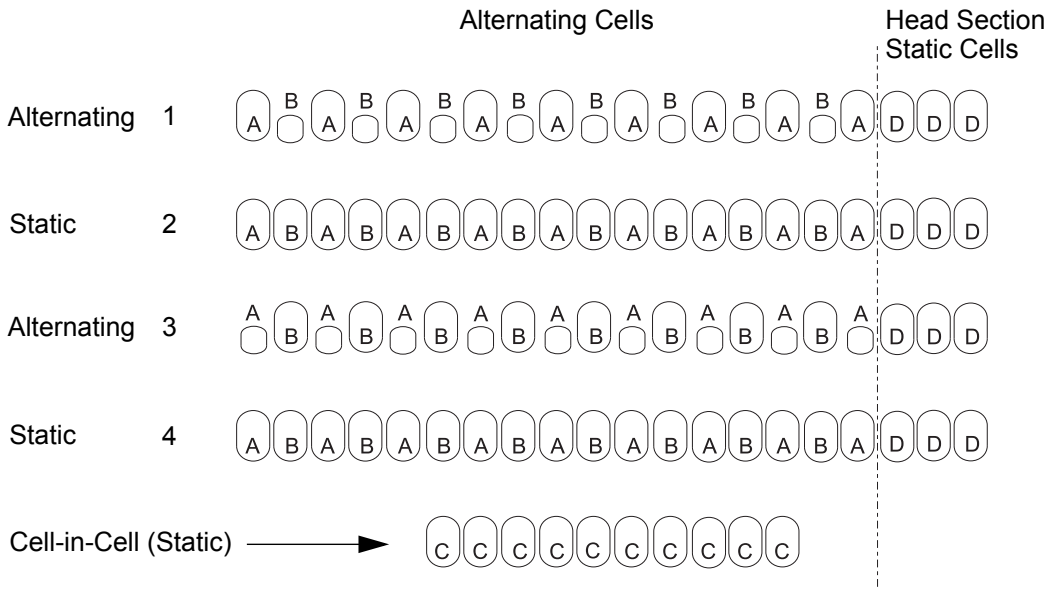


Figure 8 - Mattress Overlay Cell Inflation Cycle

Alarms and Indicators (Refer to Figure 9)

The yellow **Wait** indicator is illuminated when the mattress/seat is being inflated. The indicator remains illuminated until the mattress/seat has been fully inflated.

The red **Low Pressure** indicator is illuminated whenever the pump detects low pressure within the mattress/seat. An audible alarm sounds unless cancelled by the **Mute** button. The indicator extinguishes once normal pressure is reached.

The yellow **Battery Low** indicator illuminates two hours before battery failure. One hour before battery failure, the pump will default to **Reactive (Constant Lower Pressure) (CLP)** mode, an audible alarm sounds and the yellow indicator flashes.

The **Power Fail** indicator illuminates when a mains power failure has been detected and no battery backup is available. An audible alarm sounds until power is resumed or the pump is switched off using the run/standby button.

The yellow **Service** indicator illuminates and remains on after a set number of running hours. This indicates that the pump is due for a service. The pump continues to function normally even when the service indicator is illuminated. If the yellow **Service** indicator flashes, the pump has detected an internal fault and requires service attention.

During an alarm condition (except **Power Fail**), the sound of the alarm can be muted by pressing the **Alarm Mute** button. The yellow indicator then remains on but the alarms are muted for 15 minutes or until the alarm condition has been corrected.

Replacement Sub-Assemblies

The main replaceable sub-assemblies in the pump are:

- Manifold assembly.
- Compressor assembly.
- Control PCB assembly.
- Power supply PCB assembly.

Replacement sub-assemblies are factory-calibrated and do not require any further calibration after they have been installed in the pump.

Pressure Transducer Calibration

The pump utilizes a precise and accurate pressure measurement and control system. It is factory-calibrated and is not expected to require re-calibration until after several years of continuous use. The measurement system automatically compensates for the effects of drift and temperature change and does not normally require any user intervention.

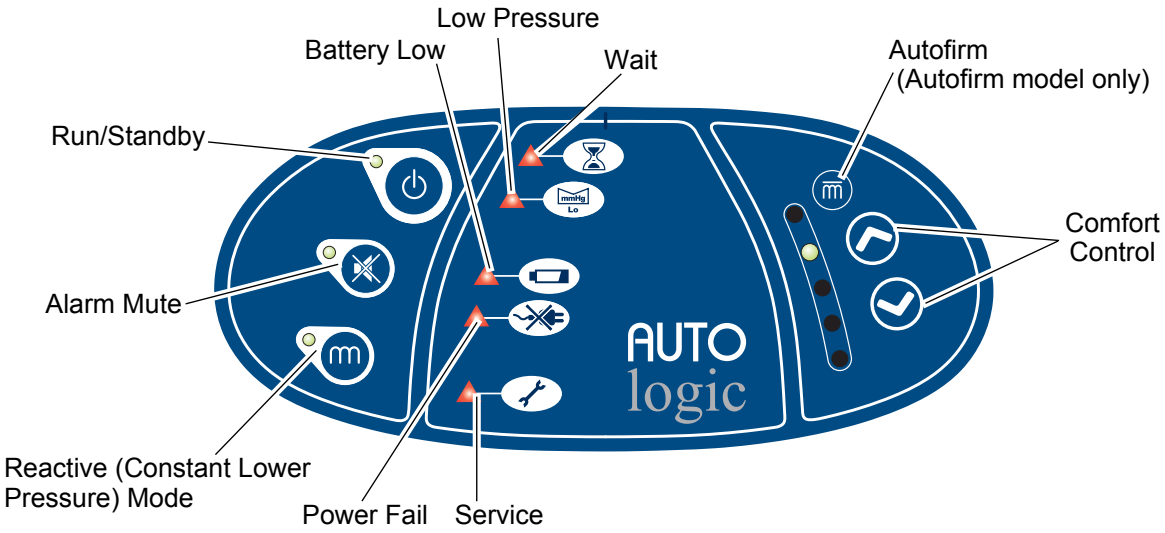


Figure 9 - Pump Control Panel (Autofirm version)

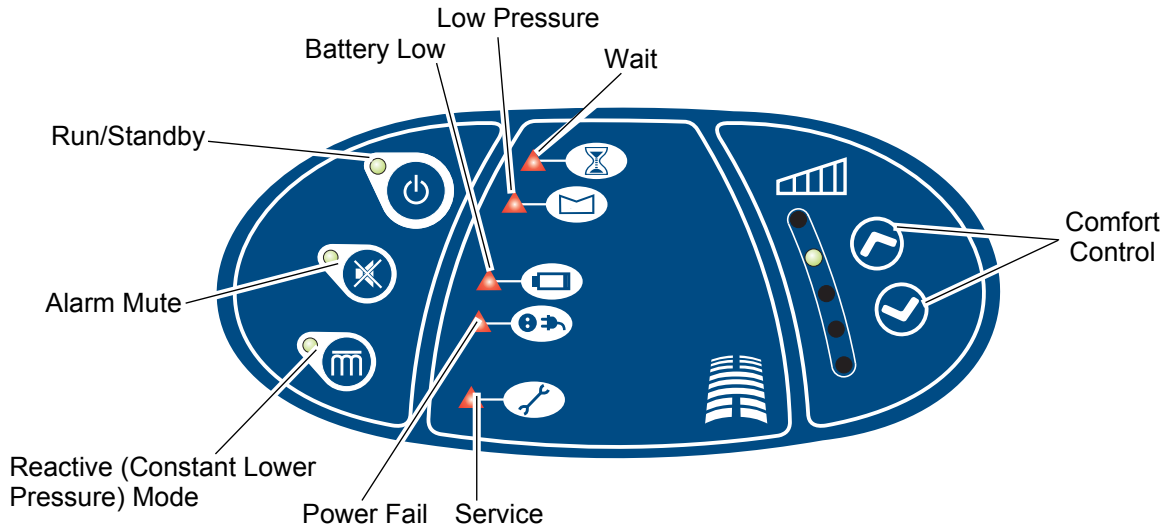


Figure 10 - Pump Control Panel (630448 “H” Branding)

Battery on the Control PCB Assembly

The battery on the control PCB assembly provides power for the real time clock and does not normally require replacement until after several years of continuous use. Replacement of the battery causes the real time clock to lose its time and date settings. These can only be reloaded from a PC-based service tool, so the procedure should only be carried out in an ArjoHuntleigh service environment.

Mattress Overlay Core

Refer to Figure 7 for the Pneumatic Schematic for the Pump and Mattress.

The alternating feeds “A” and “B” supply air to the 17 alternating cells in the mattress overlay core. At the end of each ten minute cycle, the pump performs a pressure optimization cycle to automatically sense and adjust the air pressure of feeds “A” and “B” according to the weight of the patient. The comfort control on the pump control panel is used to make adjustments to the automatically calculated air pressure.

The three head cells are supplied from a static feed “D”, which is generated by two partial non-return valves from the alternating feeds “A” and “B”. The partial non-return valves allow the air in the head cells to slowly bleed away so that they are never at the maximum “A” / “B” pressure.

The two cell-in-cells in each of the 10 cells in the centre of the mattress are supplied from the pump static feed “C” via a non-return valve. The static feed “C” also supplies the low air loss patch under the cells.

If the tubeset is disconnected, the mattress overlay core is automatically sealed and the “A” and “B” lines joined (denoted by the dotted line). This maintains an equal pressure across all cells until the tubeset is reconnected.

Mattress Base Pad

Refer to Figure 7 for the Pneumatic Schematic for the Pump and Mattress.

There are three pneumatic connections between the mattress overlay core and the mattress base pad:

- Static air feed “C” from the static cell-in-cell line in the mattress overlay core.
- Static air feed “D” from the static head cell line in the mattress overlay core.
- Emergency air evacuation from the main body zone in the mattress base pad to the CPR in the mattress overlay core.

The static air feed “C” supplies the outer perimeter cell zone in the mattress base pad.

The static air feed “D” supplies the inner main body zone on the mattress base pad via a valve assembly, which comprises two valves within a single valve body. One valve in the valve assembly has a 5 mmHg crack pressure into the main body zone (from the mattress overlay to the mattress base pad), and the other valve has a 30 mmHg crack pressure away from it (from the mattress base pad to the mattress overlay).

During normal operation, the main body zone is inflated from the mattress overlay core via the 5 mmHg crack pressure side of the valve assembly. This keeps the mattress base pad very firm, since there is only a 5 mmHg pressure drop from the static head cell line. But if the pump or mattress overlay fails, and the pressure in the mattress overlay core reduces to zero, the pressure in the main body zone of the mattress base pad will bleed off via the 30 mmHg crack pressure side of the valve assembly to leave the main body zone at just 30 mmHg pressure for the patient to lie on more comfortably.

The pneumatic connections between the mattress overlay core and the mattress base pad are valved on the air feed “C” and “D” lines. These automatically seal the mattress overlay core if the overlay and base pad are separated.

There are three outlets on the CPR assembly. When the CPR is operated on the mattress overlay, the air is evacuated from the mattress as follows:

- Outlet 1 evacuates the static air feed “C” from the static cell-in-cell line in the mattress overlay core and from the perimeter cell zone in the mattress base pad.
- Outlet 2 evacuates the static air feed “D” from the static head cell line and the alternating cells in the mattress overlay core.
- Outlet 3 evacuates the air from the main body zone in the mattress base pad. This is to bypass the valve assembly in the static air feed “D” line into main body zone of the mattress base pad.

Seat Cushion

Refer to Figure Note: for the Pneumatic Schematic for the Pump and Seat Cushion.

The seven cells in the seat cushion are connected to the two alternating feeds “A” and “B” from the pump via a 2-way tubeset. The seat cushion has no static cells, so the static feed from the pump is blanked off inside the seat tubeset connector. The seven cells are not discrete, individually-replaceable cells but are a one-piece manufactured item and can only be replaced as a single cell assembly.

There are four short manifolds welded into the base sheet assembly, two at each end of the cells. Cells 1, 3, 5 and 7 are connected to one pair of manifolds and cells 2, 4 and 6 are connected to the other pair. On one side of the mattress, the two manifolds are connected via the seat tubeset to the two alternating feeds “A” and “B” from the pump. The two manifolds at the opposite end of the cells are to equalise the pressures in alternate cells.

There are two small dump valves on the underside of the base cover (Refer to Figure 5) which are used to release the air inside the seat cushion in an emergency or for storage. These are connected to the two manifolds adjacent to the seat tubeset. The dump valves are depressed manually to release the air.

The seat cushion tubeset can be connected to and recognised by any pump in the **Logic** range.

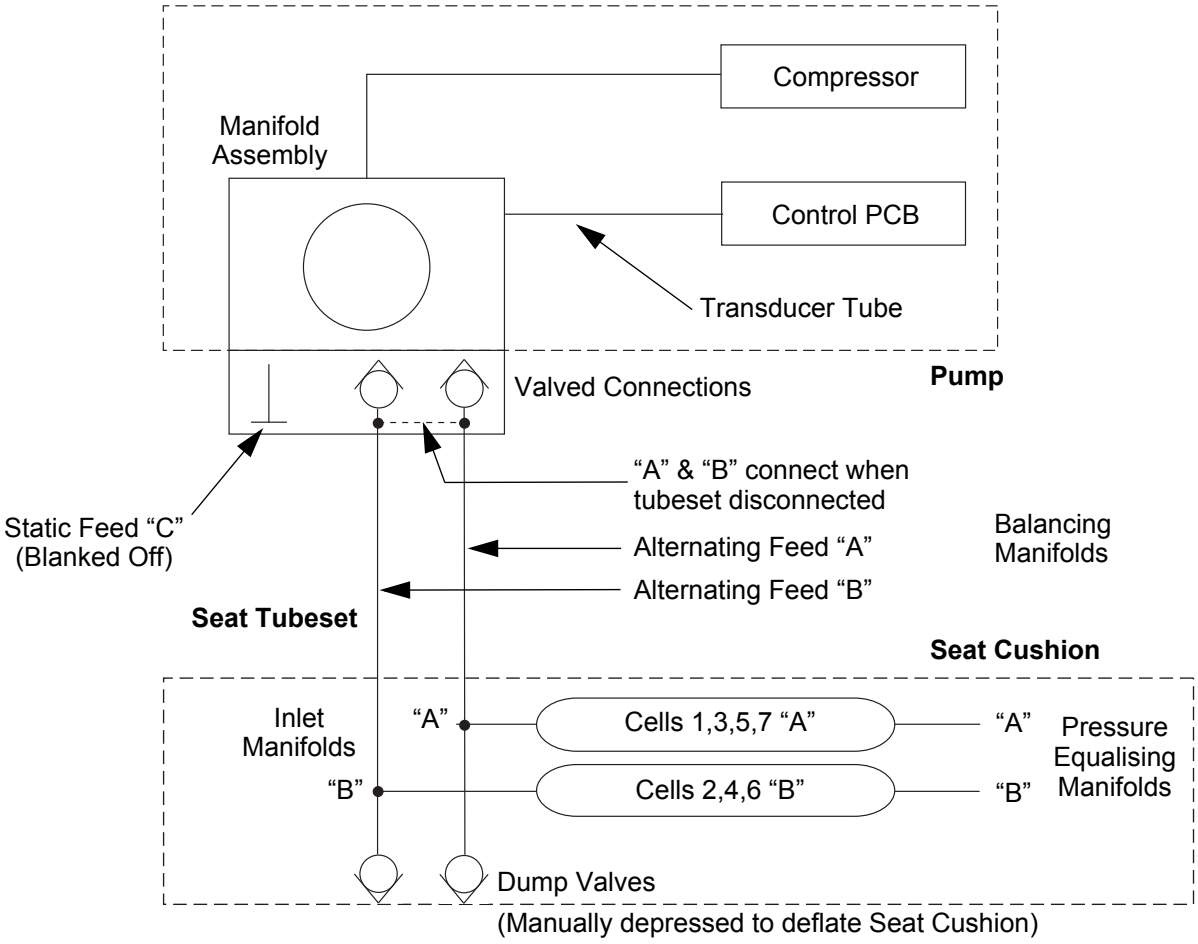


Figure 11 - Pneumatic Schematic for Pump and Seat Cushion

Auto-Recognition System

When the tubeset connector on the end of the mattress overlay or seat cushion is connected to the pump, the pump automatically recognises which system has been connected, and adjusts the pump output pressures accordingly.

The auto-recognition system is short-range radio-based technology, comprising the following:

- A programmable device located in the tubeset connector on the mattress overlay and seat cushion.
- An RFID (Radio Frequency Identification) coil antenna located on the pump manifold assembly.

System Start Up Sequence (Refer to Figure 9)

4.1 When the pump is switched on at the mains/power supply or a battery pack is connected, a Built-In Self-Test (BIST) routine will run. The BIST routine is as follows:

4.1.1 The green indicator on the front of the pump illuminates.

4.1.2 After approximately one second, the green indicator on the front of the pump extinguishes, and the sounder “beeps” twice.

4.1.3 All the indicators on the pump control panel and the front case remain extinguished.

4.1.4 The duration of the BIST routine is approximately 30 seconds.

4.1.5 If the Run/Standby button is pressed during the BIST routine, the Run/Standby indicator illuminates immediately and at the end of the BIST routine the pump begins Run mode (Refer to Para 3.2). Otherwise the pump enters into Standby mode.

4.2 At the end of the BIST routine, if the pump is not already in the Run mode, press the Run/Standby button on the pump control panel to start the Run sequence, as follows:

4.2.1 The green indicator on the front case and the Wait and Comfort indicators on the pump control panel illuminate immediately.

4.2.2 The Run/Standby indicator quickly flashes on - off - on, and then remains illuminated.

4.3 Allow approximately seven minutes for the mattress overlay, 15 minutes for the mattress replacement or three minutes for the seat cushion to inflate fully.

4.4 The amber Wait indicator extinguishes once the mattress/seat is fully inflated.

4.5 Once a patient is on the mattress, the pump automatically senses and adjusts the pressure in the cells for the appropriate patient weight.

Note: *After the BIST routine has been completed, pumps running software version 2.03 or above do not produce a beep sound.*

CHAPTER 2

TROUBLESHOOTING

1 Controls, Alarms and Indicators (Refer to Figure 12)

The pump features an audible and visual alarm. If a problem occurs, the system will:

1.1 Sense the fault.

1.2 Illuminate the relevant LED indicator on the control panel on top of the pump, and illuminate the red LED indicator on the front of the pump.

1.3 Sound an audible alarm.

During an alarm condition (except **Power Fail**), the sound of the alarm can be muted by pressing the **Alarm Mute** button on the pump control panel. The yellow **Alarm** indicator remains on but the alarm is muted for 15 minutes or until the alarm condition has been corrected (Refer to Figure 12).

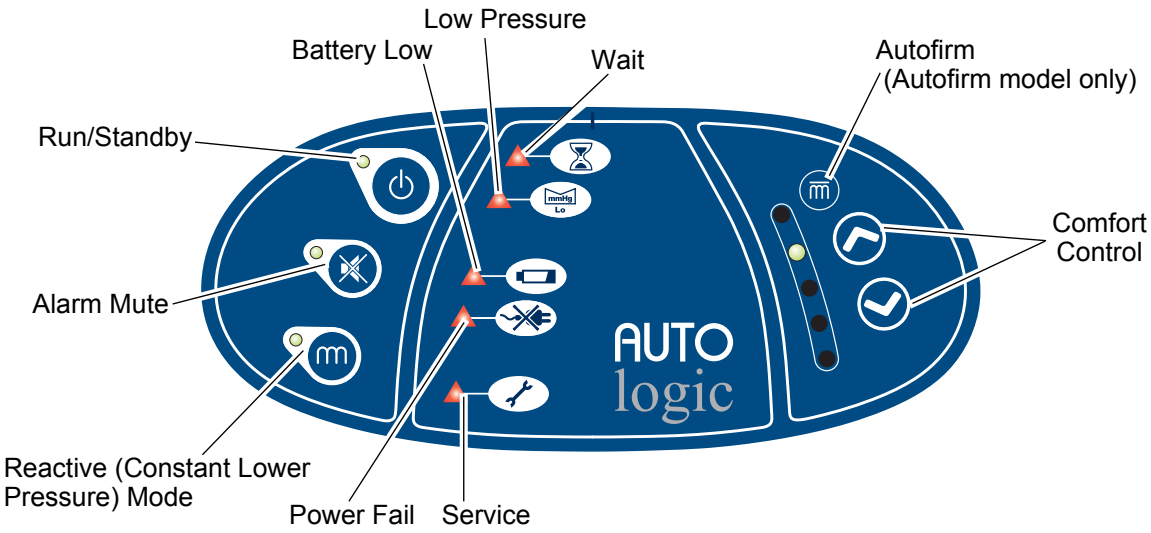


Figure 12 - Pump Control Panel (Autofirm version)

2 Diagnosing Faults

2.1 Faults in the system (i.e. pump, mattress overlay/replacement and/or seat cushion) can be diagnosed using the LED indicators on the pump control panel (Refer to Page 18, Section 3).

2.2 If the pump is connected to a computer, then the service engineer can read the Critical and Non-Critical Event Logs using the Communicator software to see if any problems or faults have occurred since the pump had its last service (Refer to Page 20, Section 4).

Note: *This feature is not available on early 630140 PCBs. To have this feature added, you must update the software to the latest version. Check Service Bulletins for the latest information.*

2.3 If the pump can ***not*** be connected to a computer, pump faults can still be diagnosed using the pump Built-In Self Test (BIST) routine. The service engineer can remove the rear case from the pump and run the BIST routine, and then diagnose pump faults by listening to and observing the operation of the sub-assemblies inside the pump (Refer to Page 31, Section 6).

2.4 Faults in the intelligent battery pack can be diagnosed using the LED indicators on the top of the battery pack (Refer to Page 33, Section 7).

3 Diagnosing Faults

The following table (Refer to Table 2) contains fault symptoms, their possible causes and suggests steps to rectify the problem. Where possible, reference is made to the relevant repair chapter.

Refer to Page 17, Section 1 for details of the controls, alarms and indicators on the pump.

Table 2 - Troubleshooting Table

Fault	Possible Cause		Remedy
Low Pressure Alarm	**Pump**	Compressor assembly failure or output low.	Replace compressor. (Chapter 5, Page 97, Section 21)
		Manifold assembly faulty.	Replace manifold assembly. (Chapter 5, Page 85, Section 11) (Chapter 5, Page 85, Section 12)
		Kinked tube to the transducer on the control PCB assembly.	Check transducer tube for kinks or obstructions.
		Blocked air filters on the rear case and compressor assembly.	Replace both air filters. (Chapter 5, Page 79, Section 5) (Chapter 5, Page 79, Section 6) (Chapter 5, Page 106, Section 31)
		Damaged/disconnected internal tubes.	Check internal tubes and replace if necessary.
		External O-rings on manifold assembly damaged/missing.	Replace O-rings. (Chapter 5, Page 91, Section 16)
	Mattress Overlay	Leak in cell assembly.	Trace and replace the faulty cell. (Chapter 6, Page 127, Section 4) (Chapter 6, Page 129, Section 5)
		CPR not closed properly.	Reset the CPR.
		Leak in CPR assembly.	Replace CPR assembly. (Chapter 6, Page 142, Section 16) (Chapter 6, Page 142, Section 17)
		Leak in manifolds.	Replace manifold. (Chapter 6, Page 131, Section 6) (Chapter 6, Page 131, Section 7)
		Test Port Not Closed	Close Test Port (Chapter 6, Page 145, Section 23)
		Leak in non-return valves.	Replace non-return valves. (Chapter 6, Page 135, Section 9)
		Damaged tubeset assembly or pump connector.	Replace tubeset assembly. (Chapter 6, Page 141, Section 14) (Chapter 6, Page 141, Section 15)
		Leak in Mattress Test Port (mattresses after July 2004).	Check Test Port is closed. Replace if necessary. (Chapter 6, Page 145, Section 23)

Table 2 - Troubleshooting Table

Fault	Possible Cause		Remedy
Low Pressure Alarm (cont.)	**Mattress Base Pad**	Damaged manifold connector assembly.	Replace manifold connector assy. (Chapter 6, Page 131, Section 6) (Chapter 6, Page 131, Section 7)
		Leak in base pad sub-assembly.	Replace base pad sub-assembly. (Chapter 6, Page 149, Section 29)
	Seat Cushion	Leak in welded cell assembly.	Replace welded cell assembly. (Chapter 7, Page 155, Section 4) (Chapter 7, Page 155, Section 5)
		Leak in base assembly manifolds.	Replace base assembly. (Chapter 7, Page 158, Section 10)
		Leak in dump valves in base assembly.	Replace base assembly. (Chapter 7, Page 158, Section 10)
		Damaged tubeset assembly or pump connector.	Replace tubeset assembly. (Chapter 7, Page 156, Section 6) (Chapter 7, Page 156, Section 7)
Service LED (Flashing)	**Pump**	Bad cable connection between control and power supply PCBs.	Check cable connection between control and power supply PCBs.
		Control PCB assembly faulty.	Replace control PCB assembly. (Chapter 5, Page 101, Section 24) (Chapter 5, Page 101, Section 25)
		Power supply PCB assembly faulty.	Replace power supply PCB assy. (Chapter 5, Page 99, Section 22) (Chapter 5, Page 99, Section 23)
		RFID coil antenna faulty.	Replace RFID coil antenna. (Chapter 5, Page 89, Section 13)
		Manifold assembly faulty.	Replace manifold assembly. (Chapter 5, Page 85, Section 11) (Chapter 5, Page 85, Section 12)
		Compressor assembly faulty.	Replace compressor assembly. (Chapter 5, Page 97, Section 21)
Service LED (Solid) [(a)]	**Pump**	Service period has expired.	Carry out service on pump. (Chapter 3, Page 37, Section 1)
		3 or more Self Set Technology (SST) errors have been detected on the pump.	Check for SST errors. (Chapter 2, Page 27, Section 5)

Table 2 - Troubleshooting Table

Fault	Possible Cause		Remedy
Auto Logic Autofirm only			
No AUTOFIRM	**Seatpad**	Autofirm is not possible with Seatpad	No action required.
	Pump	User must hold Autofirm key for 2 seconds.	Repeat training on use.
No AUTOFIRM (comfort change)	**Pump**	User is not pressing key in centre (half contact)	Repeat training on use, Switch fail, replace LAB316.
		Press UP/DOWN comfort keys simultaneously	Switch fail, replace LAB316.
		Wrong PCB installed	Auto Logic Autofirm must use PCB 654140. Replace PCB.

a. If the service period has NOT expired, illumination of the **Service LED (Solid)** is caused by the pump detecting three or more Self Set Technology (SST) errors.

4 Diagnosing Faults using the Event Logs on the Communicator Software

Note: *This feature is not available on early 630140 PCBs. To have this feature added, you must update the software to the latest version.*

4.1 If you are operating the pump from a PC via the IR Interface Module, do **NOT** switch on the mains/power supply to the pump until instructed to do so.

4.2 Connect the pump to a PC using either the Serial Communications Pack or the IR Interface Module (Refer to Chapter 4 “Testing”, Page 46, Section 5).

4.3 Run the Communicator software on the PC (Refer to Chapter 4 “Testing”, Page 49, Section 6).

4.4 Make sure that the top right of the dialog box shows the **File Version: SERS001-XX**, where “**XX**” is the version number, and must be “**02**” or higher.

4.5 Make sure **Auto Logic** is selected on the **Connection** drop-down menu, and the **Auto Logic Commands** menu is displayed.

4.6 Make sure the screen is maximised, so that the **Tx Rx** box can be viewed (Refer to Figure 13).

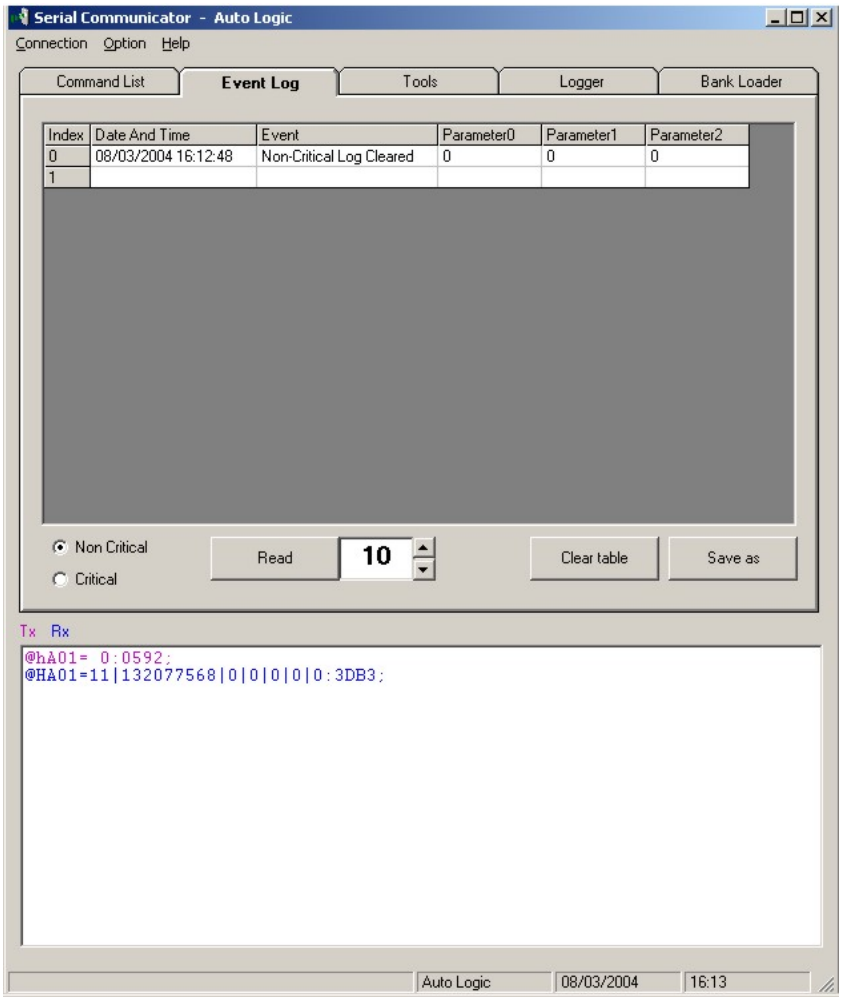


Figure 13 - Communicator Software - Event Log

4.7 To connect the mains/power supply to the pump, do the following:

4.7.1 If the Serial Communications Pack is being used:

4.7.1.1 Plug in and switch on the mains/power supply to the pump.

4.7.1.2 The power-up BIST routine runs for approximately 20 seconds (Refer to Chapter 4 “Testing”, Page 42, Section 3).

Note: *Do NOT press the **Run/Standby** button on the control panel during the power-up BIST routine.*

4.7.2 If the IR Interface Module is being used, connect the pump to the PC via the IR Interface Module (Refer to Chapter 4 “Testing”, Page 56, Section 8).

4.8 When the pump is in **Standby**, click the **Event Log** tab on the Communicator Software dialogue (Refer to Figure 13).

4.9 Make sure that **Non Critical** is selected in the bottom left of the display.

4.10 Click **Clear table**. This clears the entries displayed by the Communicator software.

Note: *It does not clear the entries in the pump.*

4.11 In the bottom centre of the screen, use the up and down arrows to select the number of events to display: 1, 10, 20, 30, 40, 50 and so on.

4.12 Click **Read**, and the selected number of events are displayed.

4.13 Check the **Event Log** entries for any system faults, (Refer to Table 3).

4.14 Typical entries in the **Non Critical Event Log** include SST Errors

4.15 Click **Clear Table** to delete the **Event Log** entries.

4.16 Click **Critical** in the bottom left of the display

4.17 Repeat steps Para 4.10 to Para 4.13, above.

4.18 Typical entries in the **Critical Event Log** include:

- **Stepper Failed**
- **RFID Failed**

Table 3 - Non Critical Event Log - SST Errors

Event Code	Parameter 0	Parameter 1	Name
01	1		**Hardware Reset** Normal start of product.
01	2		**Watchdog Reset** Indicates that some part of the software (as seen in earlier logs) has caused a problem – this has resulted in the protection circuit re-starting the system.
02			**System Run** pump has started operating on mattress or seatpad from the user pressing the start button.
04			**System Force Run** pump has automatically started operating on mattress or seatpad.
10	TASK		**Watchdog warning** The last TASK has taken more than 2.25 seconds to execute. Each task is executed sequentially. Some tasks are more complex than others and have their own scheduler such as the UI and APPS tasks. **Task list:** NO_TASK = 0 NO Function LED_TASK = 1 Update LED VALVE_TASK = 2 Check position of stepper APPS_TASK = 3 Check control system SWITCH_TASK = 4 Keypad scanning COMP_TASK = 5 Compressor control RFID_TASK = 6 RFID control UI_TASK = 7 User interface control ALARMS_TASK = 8 Checks the alarms SOUNDER_TASK = 9 Sounder control AUTOZERO_TASK = 10 Checks pressure transducer COMMS_TASK = 11 Controls IrDA, RS232 CAL_TASK = 12 Internal calibration task RTC_TASK = 13 Clock checking BATTERY_TASK = 14 Battery pack control ST7_TASK = 15 Sub-processing system LOGGING_TASK = 16 Pressure logging

Event Code	Parameter 0	Parameter 1	Name
11			**LOG_NON_CRITICAL_CLEARED** Shows the non-critical log store has been cleared using the test mode.
21	1 (Source)		**Low pressure alarm** Pressure is low in the mattress / seat pad.
21	2 (RFID start)		**Low pressure alarm** RFID tag cannot be read – may be seen if the pump is automatically restarting and there is no mattress or seat pad present.
21	3 (RFID RUN)		**Low pressure alarm** RFID tag error count exceeded.
21	4 (TAU)		**Low pressure alarm** Automatic calculation of patient weight failed - mattress leak.
21	5 (Compressor output)	count	**Low pressure alarm** Compressor has failed to provide enough air when operating on seatpad. Count is the integrated compressor output value (should be greater than 0x715 as default but is read from the RFID tag in the seatpad).
21	5 (Compressor output)	0	**Low pressure alarm** Seatpad compressor output alarm **disabled**.
21	6 (Startup)		**Low pressure alarm** Pre-inflate of main cells has timed out – either mattress or seatpad.
21	7 (Startup sidecells)		**Low pressure alarm** Preinflate of mattress side cells has timed out.
21	8 (RFID code invalid)	TYPE	**Low pressure alarm** Mattress code returned has not been recognised. Mattress is C0 Seatpad is D9
21	9 (TAU Poor curve)		**Low pressure alarm** Automatic calculation of patient weight failed - but not due to a leak.
22	1 (Source)		**Low pressure CLEARED** Mattress / Seatpad operation now restored - no leak.
22	2 (RFID Start)		**Low pressure CLEARED** Cleared alarm caused by failure to read RFID.

Event Code	Parameter 0	Parameter 1	Name
22	5 (Compressor output)		**Low pressure CLEARED** If the low pressure alarm was caused by a TAU error (which makes compressor run too hard), clear the error.
23	4 (TAU)		**Low pressure DETECTED** A measurement error has been recognised, this is the first step to creating an alarm for a leak.
23	9 (TAU Poor curve)		**Low pressure DETECTED** A measurement error has been recognised, this is the first step to creating a low pressure alarm – but there is no leak.
23	6 (Startup)		**Low pressure DETECTED** Side cell inflate has not occurred.
31			**Mattress changed** The type of mattress has changed to a seatpad OR the seatpad has been changed for a mattress.
32	1 (pressure LOW)	Pressure 1 Pressure 2	**Pressure transducer reading** The pressure read has been too low, Pressure 1 is the pressure which has been read Pressure 2 is the minimum allowed system pressure.
32	2 (pressure HIGH)	Pressure 1 Pressure 2	**Pressure Transducer reading** The pressure read has been too HIGH. Pressure 1 is the pressure which has been read. Pressure 2 is the maximum allowed system pressure.
3A	10 (Level)	Level	**Compressor function error** An attempt has been made to set the compressor output level to be higher than the maximum allowed (32).
3A	11 (Frequency)	Frequency	**Compressor function error** An attempt has been made to set the compressor output Frequency to be higher than the maximum allowed (62).
3A	FFF (invalid return)		**Compressor function error** Compressor output could not be set, but the cause was not Level or Frequency.
40	1 (Static mode)	Pressure	**Light Patient** A light patient has been noted and the target pressure recorded.
40	2 (ALT mode)	Pressure	**Light Patient** A light patient has been noted and the target pressure recorded.
41	1 (Static mode)	Pressure	**Heavy Patient** A light patient has been noted and the target pressure recorded.
41	2 (ALT mode)	Pressure	**Heavy Patient** A light patient has been noted and the target pressure recorded.

Event Code	Parameter 0	Parameter 1	Name
42	1 (Static mode)	Pressure	**Pressure setting** Note the weight set by the automatic weighing system in static mode.
42	2 (ALT mode)	Pressure	**Pressure setting** Note the weight set by the automatic weighing system in Active (Alternating) mode.
43	1 (Static mode)		**Operating mode** Pump has entered STATIC mode.
43	2 (ALT mode)		**Operating mode** Pump has entered ALT mode.
43	3 (IDLE mode)		**Operating mode** Pump has entered IDLE mode.
43	4 (Seatpad mode)		**Operating mode** Pump has entered SEATPAD mode.
45			**FLOATING POINT ERROR** An error has occurred in the calculations of the weighing function. Causes are negative pressures or No data. Weight for this cycle is rejected.
50	2 (Crossover compressor level)	LEVEL	**USER CHANGES** User has changed the maximum compressor level allowed at crossover.
50	3 (Seatpad Low pressure)	Threshold	**USER CHANGES** User has changed the Seatpad low pressure level.
50	4 (Auto Cal)		**USER CHANGES** Pump re-calibration cycle has ended.
50	5 (Gain Pot)	Level	**USER CHANGES** User has manually changed the pressure transducer gain.
50	6 (Balance)	Balance	**USER CHANGES** User has manually changed the pressure transducer balance (zero level).
50	7 (Service interval)	Hours	**USER CHANGES** User has changed time between service intervals.
58	1 (Reset)		**Stepper error** Stepper system has not accepted the commands given and has been reset.

Event Code	Parameter 0	Parameter 1	Name
58	2 (Speed)	Speed 40	**Stepper error** The stepper is moving either too fast or too slow, a value of 40 is nominal but will fail for values under 20 or over 100.
58	3 (return error)	Status	**Stepper error** The information returned (status) has not been recognised.
58			**Stepper error** The position of the stepper is not correct when moving to the lock position.
60			**Button pressed** 1 = Comfort UP 2 = Alarm Mute 3 = Alarm Enable 4 = Static ON 5 = Static OFF
70	1 (Battery LOW)	Battery Level	**Battery pack** Battery pack has reported LOW (<15%).
70	2 (Battery EMPTY)	Battery Level	**Battery pack** Battery pack has reported EMPTY (<5%).
CRITICAL LOGS			
81	2 (sync)		**STEPPER FAIL** Stepper did not detect the synchronisation mark.
81	5 (reset)		**STEPPER FAIL** Too many errors in the stepper system – resetting the system. If in self test mode, the pump is also reset.
82	1 (phase)		**RFID FAIL** Self test could not detect the phase of the internal coil.
82	2 (read)		**RFID FAIL** Self test could not read the RFID device.
82	FFFF		**RFID FAIL** Self test had an unknown RFID failure.
84	1 (GMT reset)		**Real Time Clock** Time has been reset.

Event Code	Parameter 0	Parameter 1	Name
84	4 (OLD time)		**Real Time Clock** Old Time when clock was reset.
84	5 (NEW time)		**Real Time Clock** New Time after clock was reset.
89			**Critical logs cleared**
92			**Self Test Compressor Fail**
93			**Self Test Pressure test Fail**
94			**Self Test Pressure transducer Fail** Calibration may be required.

5 Check for Self Set Technology (SST) Errors

The **Auto Logic** systems do not have a pressure sensor pad in the mattress. Instead, the pump incorporates Self Set Technology (SST), which adjusts the air pressure within the mattress every 10 minutes in **Active (Alternating)** mode and 20 minutes in **Reactive (Constant Lower Pressure) (CLP)** mode to suit the Body Mass Index (BMI) and position of the patient.

If there are three SST-related errors on consecutive SST cycles, the yellow **Service** indicator is permanently illuminated (not flashing) and the **Event Log** on the Communicator software is updated. The audible alarm does not sound. The **Service** indicator remains permanently illuminated (even during **Standby**) until there have been 30 error-free SST cycles, after which time the **Service** indicator is extinguished. Each SST cycle in **Active (Alternating)** mode is 10 minutes, so the 30 error-free SST cycles indicate that approximately five hours of error-free operation have been completed.

If the **Service** indicator is permanently illuminated (not flashing), then there are two possible conditions:

- The pump has detected three SST-related errors on consecutive SST cycles (as detailed above).
- The pump is due for a routine service.

Carry out the following procedure to check whether SST-related alarms have occurred.

5.1 If you are operating the pump from a PC via the IR Interface Module, do **NOT** switch on the mains/power supply to the pump until instructed to do so.

5.2 Connect the pump to a PC using either the Serial Communications Pack or the IR Interface Module (Refer to Chapter 4 “Testing”, Page 46, Section 5).

5.3 Run the Communicator software on the PC (Refer to Chapter 4 “Testing”, Page 49, Section 6).

5.4 Make sure that the top right of the dialog box shows the **File Version: SERS001-XX**, where “**XX**” is the version number, and must be “**02**” or higher.

5.5 Make sure **Auto Logic** is selected on the **Connection** drop-down menu, and the **Auto Logic Commands** menu is displayed.

5.6 Make sure the screen is maximised, so that the **Tx Rx** box can be viewed (Refer to Figure 13).

5.7 To connect the mains/power supply to the pump, do the following:

5.7.1 If the Serial Communications Pack is being used:

5.7.1.1 Plug in and switch on the mains/power supply to the pump.

5.7.1.2 The power-up BIST routine runs for approximately 20 seconds (Refer to Chapter 4 “Testing”, Page 42, Section 3).

Note: *Do NOT press the **Run/Standby** button on the control panel during the power-up BIST routine.*

5.7.2 If the IR Interface Module is being used, carry out the procedure to connect the pump to the PC via the IR Interface Module (Refer to Chapter 4 “Testing”, Page 56, Section 8).

Check if the Pump is due for a Routine Service

5.8 On the Communicator software, scroll through the menu of **Auto Logic Commands** to the section heading **SERVICE** (Refer to Chapter 4 “Testing”, Page 54, Section 7).

5.9 Send the command **206 - Read Run Hours**. Check the **hours** value displayed in the **Receive** part of the dialog box:

5.9.1 If the **hours** value is 17520 or above (i.e. **206 = 17520 hours**), then the pump is due for routine service (Refer to Chapter 3 “Maintenance”, Page 1,Section 1).

5.9.2 if the **hours** value is greater than zero but less than 17520 (e.g. **206 = 8000 hours**), then the pump has detected three SST-related errors on consecutive SST cycles. Continue this test procedure at Para 5.10, below:

Check and Clear SST Errors

Note: *This section is only applicable to 630140 or 630400 PCBs that have compatible software installed. Check Service Bulletins for the latest information.*

If three SST-related errors occur on consecutive SST cycles, the fault condition will not be cleared until there have been a further 30 error-free SST cycles. When the fault condition is initially detected, a count of **30** is set up and decremented by one every time an “error-free SST cycle” has been completed.

5.10 Send the command **207 - Read_SST_Errors**. The value received from the pump is the “error-free SST cycle” count, which will be a value between **0** and **30**:

- A value of **0** indicates the fault has now been cleared.
- A value between **1** and **30** indicates that no “error-free SST cycles” have occurred, and the fault is not cleared.

5.11 Check the **Non Critical Event Log** to see when the SST errors occurred (Refer to Page 20, Section 4).

5.12 Refer to Table 3 for the **Non Critical Event Log** entries for SST errors. (Values are Hexadecimal).

5.13 To reset the SST error count on the pump, do the following:

5.13.1 Send the command **703 - Enable_Test_Mode**, to put the pump into test mode.

5.13.2 Send the command **208 - Reset_SST_Errors**, to reset the SST error count.

5.14 Switch off the mains/power supply to the pump.

Checking and Clearing SST Errors on pump units with early 630400 PCB and all Autofirm pumps

Note: *This section only applies to those pumps using the early 630400 PCB and later PCB 630140 with suitable software.*

5.15 Send the command **207 - Read_SST_Errors**. The value received from the pump is the “error-free SST cycle” count, which is a value between **0** and **30**:

- A value of **0** indicates the fault has now been cleared.
- A value between **1** and **30** indicates that no “error-free SST cycles” have occurred, and the fault is not cleared.

5.16 To reset the SST error count on the pump, do the following:

5.16.1 Send the command **703 - Enable_Test_Mode**, to put the pump into test mode.

5.16.2 Send the command **208 - Reset_SST_Errors**, to reset the SST error count.

5.17 Switch off the mains/power supply to the pump.

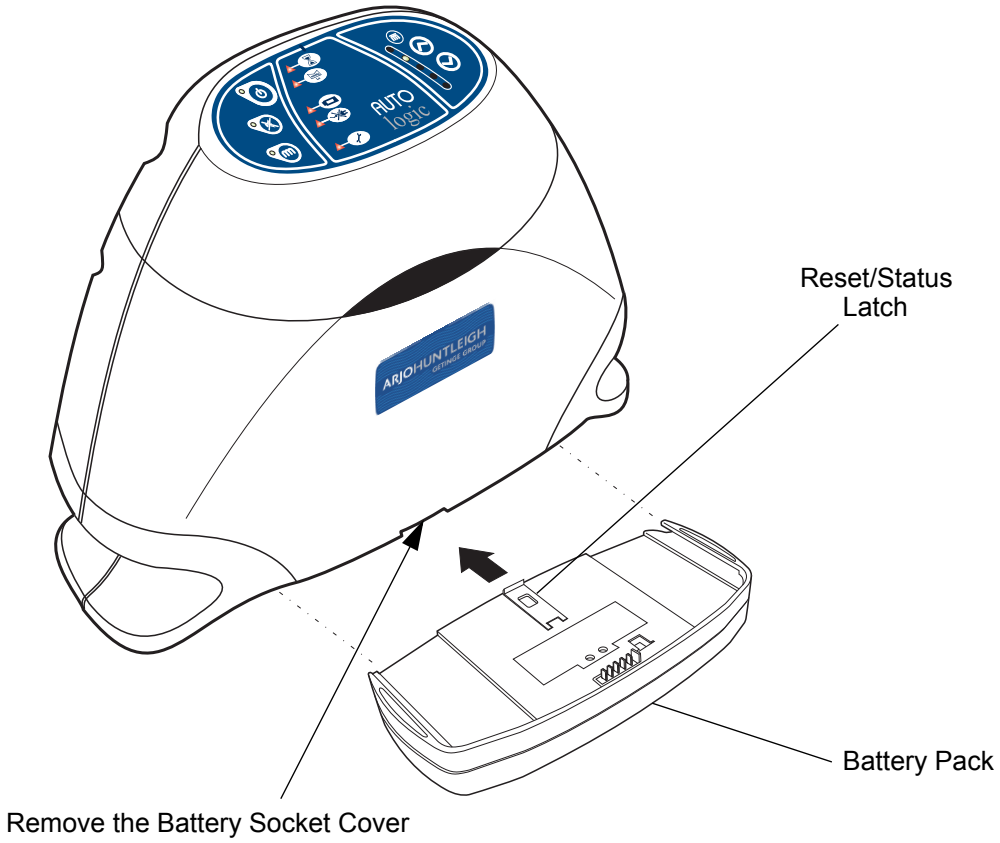


Figure 14 - Installing the Battery Pack

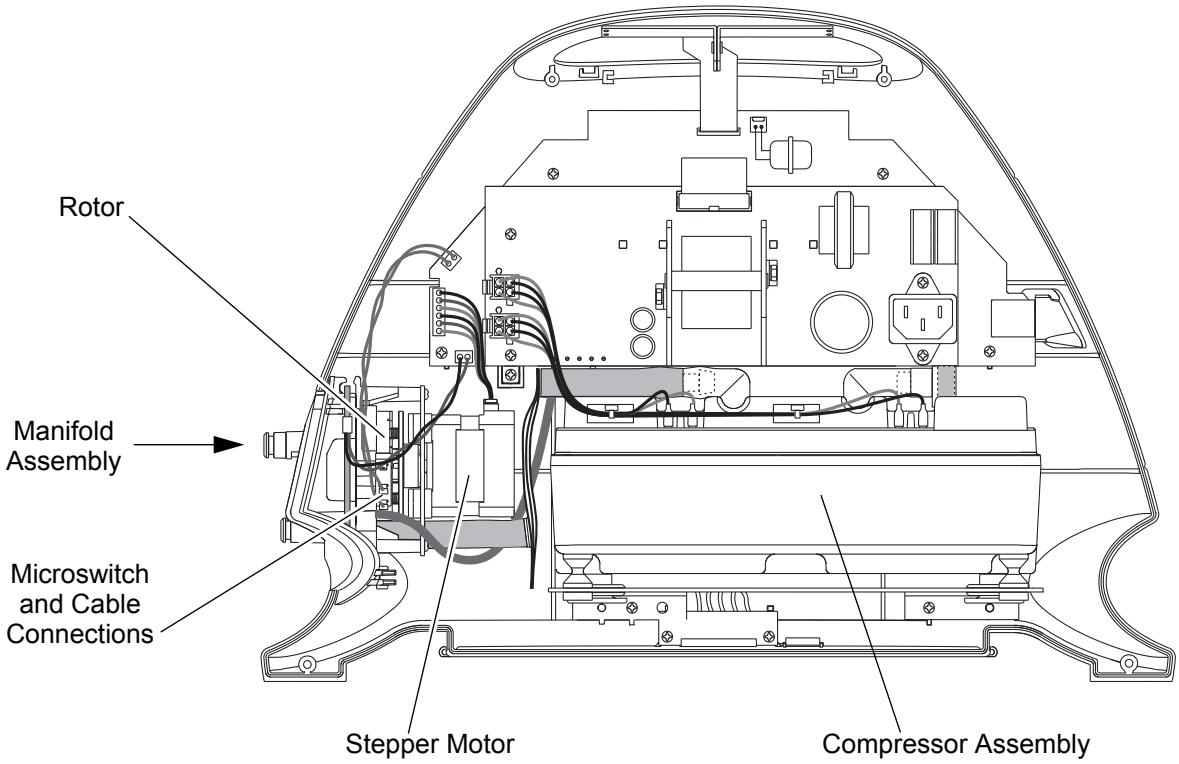


Figure 15 - Checking the Pump Sub-Assemblies during the BIST Routine

6 Diagnosing Pump Faults using the Built-In Self-Test Routine with no PC

WARNING: ONLY THE BATTERY PACK SHOULD BE USED TO POWER THE PUMP WHEN THE REAR CASE IS REMOVED. IF MAINS/POWER IS APPLIED TO THE PUMP WITH THE REAR CASE REMOVED, VOLTAGES IN EXCESS OF 230 VOLTS RMS / 400 VOLTS DC ARE PRESENT ON THE POWER SUPPLY PCB ASSEMBLY AND CAN, IN CERTAIN CIRCUMSTANCES, BE LETHAL.

6.1 Whenever the pump is switched on at the mains/power supply or a battery pack is connected, a Built-In Self-Test (BIST) routine will run. The ***successful*** BIST routine is as follows:

6.1.1 The **green** indicator on the front of the pump illuminates.

6.1.2 After approximately one second, the **green** indicator on the front of the pump extinguishes, and the sounder “beeps”.

6.1.3 All the indicators on the pump control panel and the front case remain extinguished.

6.1.4 After approximately 20 seconds, the sounder “beeps” at the end of the successful BIST routine, and the pump enters **Standby** mode.

6.2 If the pump fails the BIST routine, the service engineer can remove the rear case from the pump and re-run the BIST routine using the battery pack. Pump faults can then be diagnosed by listening to and observing the operation of the sub-assemblies inside the pump.

6.3 Remove the rear case from the pump (Refer to Chapter 5 “Pump Repair”, Page 80, Section Note:).

6.4 Lay the pump down with the internal sub-assemblies facing upwards.

6.5 To re-run the BIST routine, install a battery pack onto the pump, as follows (Refer to Figure 14):

6.5.1 Make sure the battery pack is not discharged.

6.5.2 Remove the battery socket cover from the base of the pump.

6.5.3 From the front of the pump, slide the battery pack over the guides on the base of the pump, and click into place.

Note: *Make sure the pump sub-assemblies are still facing upwards.*

6.5.4 As soon as the battery pack clicks into place, the BIST routine will start.

6.6 If the BIST routine has failed, it can be re-started by either of the following:

6.6.1 Pressing the **Run/Standby** button (Refer to Figure 12).

6.6.2 Removing and re-installing the battery pack onto the pump.

6.7 The ***successful*** BIST routine, with the rear case removed, is as follows (all times are approximate):

Note: *Refer to Figure 15 for the positions of the relevant pump sub-assemblies.*

6.7.1 The sounder “beeps” at the start of the BIST routine.

6.7.2 The rotor on the manifold assembly turns for six seconds, and then stops briefly.

6.7.3 The rotor then turns again for six seconds, and then stops again briefly.

6.7.4 The rotor finally turns again for one second, and stops completely.

6.7.5 The compressor assembly then runs for two seconds and stop.

6.7.6 The rotor on the manifold assembly turns in the opposite direction for one second, and stops completely.

6.7.7 Finally, the sounder “beeps” to indicate the end of the successful BIST routine.

Note: *The successful BIST routine completes in approximately 20 seconds.*

6.8 If the BIST routine fails, then diagnose the possible pump faults as follows:

6.8.1 If the rotor on the manifold assembly does not turn (Refer to Paras 6.7.2 or 6.7.3), the stepper motor is faulty.

- Replace the manifold assembly (Chapter 5 “Pump Repair”, Page 85, Section 11 and Chapter 5 “Pump Repair”, Page 85, Section 12).

6.8.2 If the rotor turns continuously (Refer to Para 6.7.2) and does not stop turning, then the stepper motor cannot find sync because the microswitch or wiring is faulty. Check that the microswitch cable is securely connected to the control PCB assembly, and to the correct terminals on the manifold assembly microswitch (Refer to Chapter 5 “Pump Repair”, Page 85, Fig 43). If they are, the manifold assembly is faulty.

- Replace the manifold assembly (Chapter 5 “Pump Repair”, Page 85, Section 11 and Chapter 5 “Pump Repair”, Page 85, Section 12).

6.8.3 If the compressor assembly does not run for 2 seconds and stop (Refer to Para 6.7.5), three attempts will be made to run the compressor assembly when the manifold assembly is in the blocked tube position. After each attempt the stepper motor on the manifold assembly will move through sync and return. If three attempts are made to run the compressor assembly and the BIST routine fails, then there are four possible causes of failure:

6.8.3.1 The compressor assembly is not connected to the power supply PCB assembly.

- Check the wiring connections between the compressor assembly and the power supply PCB assembly.

6.8.3.2 The pressure transducer is out of calibration.

- Re-calibrate the pressure transducer (Chapter 4 “Testing”, Page 62, Section 12).

6.8.3.3 The pneumatic connections inside the pump are not correct.

- Check the pneumatic connections inside the pump.

6.8.3.4 The valve in the manifold assembly is in the wrong position. The manifold assembly is faulty.

- Replace the manifold assembly (Chapter 5 “Pump Repair”, Page 85, Section 11 and Chapter 5 “Pump Repair”, Page 85, Section 12).

6.8.4 If the compressor assembly runs once for a short period (Refer to Para 6.7.5) and the BIST routine still fails, the RFID (Radio Frequency Identification) coil antenna is faulty.

- Replace the RFID (Radio Frequency Identification) coil antenna (Chapter 5 “Pump Repair”, Page 89, Section 13).

6.8.5 Check that the sounder “beeps” at the start and end of the BIST routine. If it does not, the control PCB assembly is faulty.

- Replace the control PCB assembly (Chapter 5 “Pump Repair”, Page 101, Section 24 and Chapter 5 “Pump Repair”, Page 101, Section 25).

6.9 To remove the battery pack from the pump, do the following (Refer to Figure 14):

6.9.1 Depress the **Reset/Status Latch** at the rear of the pump/battery pack.

6.9.2 Slide the battery out from the base of the pump, towards the front of the pump.

6.9.3 Install the battery socket cover onto the base of the pump.

6.10 Install the rear case onto the pump (Refer to Chapter 5 “Pump Repair”, Page 81, Section 8).

7 Checking the Status and Diagnosing Faults on the Intelligent Battery Pack

General

The optional intelligent battery pack allows the pump to be used independently of the mains/power supply (Refer to Figure 16). The battery pack slides onto the base of the pump (Refer to Chapter 8 “Intelligent Battery Pack Assembly”).

The battery pack status label is on the top of the battery pack, and has two LED indicators to show the status of the battery pack or fault message (Refer to Figure 17).

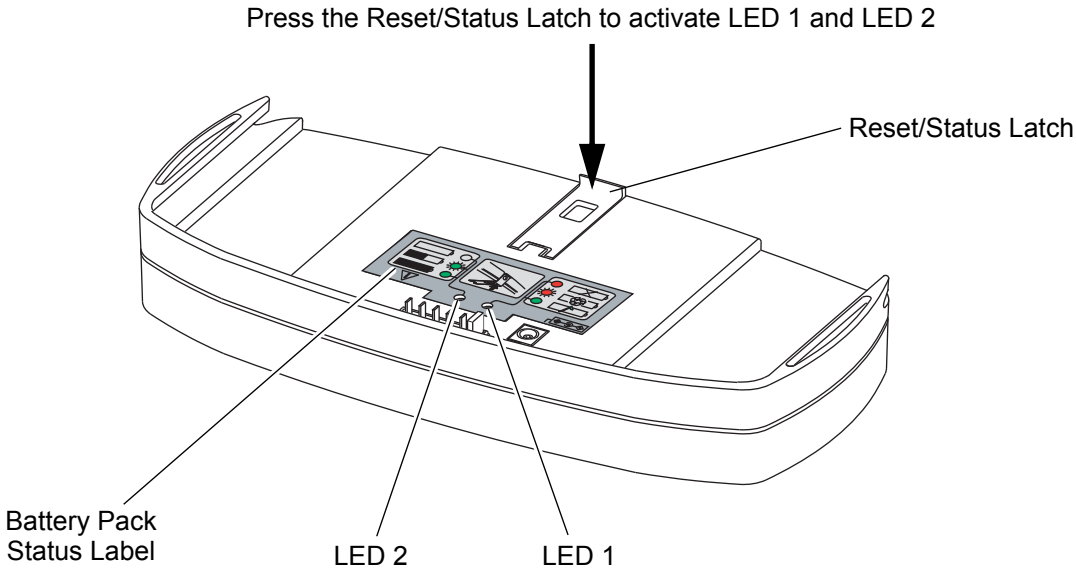


Figure 16 - Intelligent Battery Pack

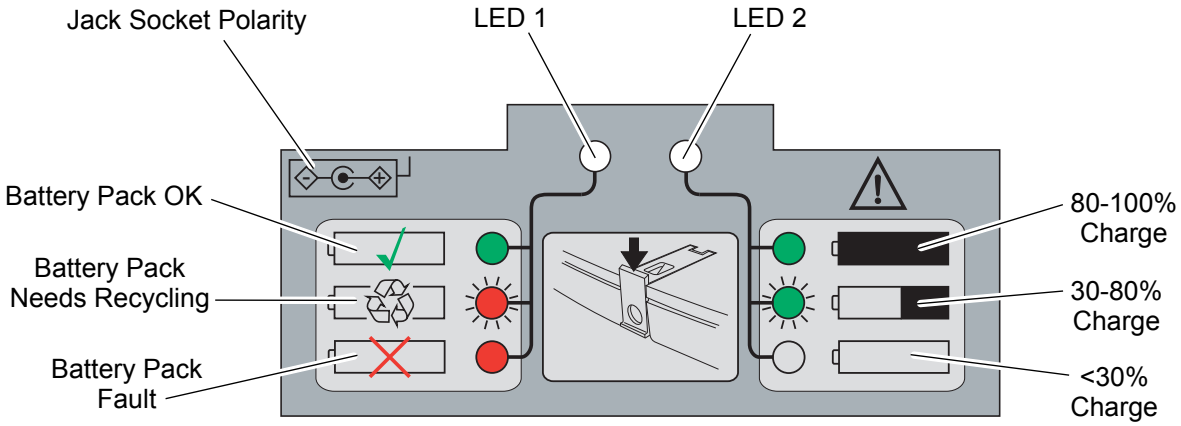


Figure 17 - Battery Pack Status Label

To Check the Battery Pack Status (Refer to Figures 16 and 17)

7.1 Remove the battery pack from the pump unit (Refer to Chapter 8 “Intelligent Battery Pack Assembly”, Page 159, Section 2).

7.2 Press the Reset/Status Latch, this activates the two LEDs on the top of the battery pack.

7.2.1 If the battery pack is ***NOT*** on charge, the two LEDs display one of the following conditions (Refer to Table 4):

Table 4 - Battery Pack Status - Battery NOT on Charge

LED 1	LED 2	Battery Pack Status
Green	Green	Battery pack is OK. It has >80% charge.
Green	Green	Battery pack is OK. It has between 30-80% charge.
Green		Battery pack is OK. It has <30% charge.
Red	Green	Battery pack requires recycling[(a)]. It has between 30-80% charge.
Red		Battery pack requires recycling[(a)]. It has <30% charge.
Red		Battery pack has an error.
		Battery pack is discharged or has an error. Try recharging.

a. Once the battery pack has entered the “recycling” mode, it can never be fully charged. This does not indicate a fault condition but does indicate that battery life is becoming limited. Full capacity can only be restored by recycling/replacing the battery.

7.2.2 If the battery pack is on charge via the optional battery charger, the two LEDs display one of the following conditions (Refer to Table 5):

Table 5 - Battery Pack Status - Battery on Charge

LED 1	LED 2	Battery Pack Status
Green	Green	Battery pack is OK. It is fully charged.
	Green	Battery pack is charging.
Red	Green	Battery pack needs recycling[(a)]. Battery pack is charging.
Red		Battery pack has an error. This could be a temporary fault due to adverse operating temperature.
		Battery pack has an error.

a. Once the battery pack has entered the “recycling” mode, it can never be fully charged. This does not indicate a fault condition, but does indicate that battery life is becoming limited. Full capacity can only be restored by recycling/replacing the battery.

Battery Pack “Conditioning” Fault

When the battery pack is manufactured and tested, it has to be “conditioned” before it will operate correctly. To “condition” the battery pack, it must be fully discharged and recharged three times. During the “conditioning” process, **LED 1** is illuminated **orange**, and extinguishes as soon as the “conditioning” process has been completed correctly.

Note: *In normal system operation,* ***LED 1*** *should never be illuminated* ***orange****.*

Fault: If **LED 1** illuminates **orange**, the battery pack is faulty and must be returned to ArjoHuntleigh.

Battery Pack Disposal

If the battery pack status indicates that it is faulty or needs recycling (Refer to Tables 4 and 5), then it should be returned to ArjoHuntleigh to be recycled.

WARNING: DO NOT DISPOSE OF THE BATTERY PACK IN DOMESTIC WASTE.

CHAPTER 3

MAINTENANCE

WARNING: BEFORE DISMANTLING THE PUMP UNIT, MAKE SURE THE UNIT HAS BEEN ISOLATED FROM THE MAINS/POWER SUPPLY BY REMOVING THE MAINS/POWER PLUG FROM THE WALL SOCKET.

WARNING: A POTENTIAL ELECTRICAL SHOCK HAZARD EXISTS ON THE POWER SUPPLY PCB ASSEMBLY WHEN THE PUMP CASE IS OPENED, EVEN WITH THE PUMP SWITCHED OFF.

CAUTION: Static Sensitive Devices. Electrostatic discharge can seriously damage the control and power supply PCB assemblies in the pump. This pump should only be opened by personnel trained in ESD methods and with appropriate equipment and anti-static protection.

1 Pump Service

The yellow **Service** indicator on the pump control panel illuminates and remains on after a preset number of running hours, to indicate that the pump is ready for a service. Typically, this service interval is set to 17,520 running hours (two years continuous use).

To service the pump, do the following:

Note: *A computer must be used in order to set the service hours.*

1.1 Carry out the pump maintenance checks, detailed below (Refer to Page 38, Section 2).

1.2 Replace the following components:

1.2.1 Air inlet filter on the compressor assembly (Refer to Chapter 5 “Pump Repair”, Page 106, Section 31).

1.2.2 Inlet filter felt on the rear case (Refer to Chapter 5 “Pump Repair”, Page 79, Section 5 and Chapter 5 “Pump Repair”, Page 79, Section 6).

1.3 Check that the sounder and power fail LED indicators on the pump are operating (Refer to Chapter 4 “Testing”, Page 69, Section 14).

1.4 Check the pump pressures and free flows using a PC and the Communicator software (Refer to Chapter 4 “Testing”, Page 58, Section 10).

1.5 Check that the calibration of the pressure transducer is correct (Refer to Chapter 4 “Testing”, Page 60, Section 11).

1.6 Set the service hours back to 17520 (Refer to Chapter 4 “Testing”, Page 69, Section 14).

1.7 Carry out the electrical safety tests (Refer to Chapter 4 “Testing”, Page 74, Section 19).

1.8 Carry out the basic system operation test (Refer to Chapter 4 “Testing”, Page 42, Section 3).

2 Pump Maintenance Checks

2.1 Visually inspect the following for damage, wear and potential faults. If any parts are found to be damaged they must be replaced in accordance with Chapter 5 “Pump Repair”.

- Front and rear cases: Check for damage and security.
- Hooks: Check for damage and security.
- O-rings and outlet ports on the manifold assembly: Check for damage.
- Membrane control panel: Check for damage and security to case.
- Mains/power lead: Check for damage and security of plug
- Rubber feet (8 0ff): Check for security.
- Labels (2 off): Check all labels are present and legible

2.2 Remove the rear case (Refer to Chapter 5 “Pump Repair”, Page 77, Section Note) and visually inspect the following for damage, wear, security and potential faults:

- Series 6 compressor assembly, including anti-vibration mounts.
- Manifold assembly.
- Control PCB assembly, including rechargeable battery.
- Power supply PCB assembly, including fuses.
- Battery pack connector, including connector sealing strips.
- Ferrite magnet, secured to case adjacent to battery pack connector.
- Wiring.
- Internal Tubing.
- Screws, nuts and bolts.

3 Mattress Replacement and Mattress Overlay Service

To carry out a service on the mattress replacement or mattress overlay, do the following:

3.1 Carry out the mattress replacement and mattress overlay maintenance checks, detailed below (Refer to Page 39, Section 4).

3.2 Carry out an inflation test of the mattress replacement or mattress overlay (Refer to Chapter 4 “Testing”, Page 75, Section 20).

4 Mattress Replacement and Mattress Overlay Maintenance Checks

Visually inspect the following for damage, wear and potential faults. If any parts are found to be damaged they must be replaced in accordance with the following:

- Mattress Replacement: Refer to Chapter 6 “Mattress Repair” and Chapter 6, Page 144, Section 22.
- Mattress Overlay: Refer to Chapter 6 “Mattress Repair”.

• Top cover:	Check for tears, staining, clarity of printed labels.
• Top cover zip:	Check zip runs freely and condition of zip teeth.
• Cell assemblies:	Check for damage and security.
• Manifold and tubing, including non-return valves:	Check for damage and security.
• CPR assembly:	Check operation of the fast deflate mechanism.
• Pump tubeset assembly:	Check for damage and security of connection.
• Pneumatic connection between overlay (core) and base pad:	Check for damage and security of connection.
• Fixing straps:	Check condition and security.
• Base sheet assembly:	Check for broken/torn loops.
• Connectors:	Check for damage and security.
• Press studs:	Check for damage and security.

5 Seat Cushion Service

To carry out a service on the seat cushion, do the following:

5.1 Carry out the seat cushion maintenance checks, detailed below (Refer to Page 39, Section 6).

5.2 Carry out an inflation test of the seat cushion (Refer to Chapter 4 “Testing”, Page 75, Section 20).

6 Seat Cushion Maintenance Checks

Visually inspect the following for damage, wear and potential faults. If any parts are found to be damaged they must be replaced in accordance with Chapter 7 “Seat Cushion Repair”:

• Top cover:	Check for tears, staining, clarity of printed labels.
• Top cover zip:	Check zip runs freely, and condition of zip teeth.
• Welded cell assembly:	Check for damage and security.
• Base assembly, including manifolds:	Check for damage and security.
• Dump valves on base assembly:	Check operation of the fast deflate mechanism.
• Pump tubeset assembly:	Check for damage and security of connection.
• Fixing straps:	Check condition and security.
• Connectors:	Check for damage and security.

CHAPTER 4

TESTING

1 Pump Control Panel

Refer to Figure 18 for the layout of the buttons, alarms and indicators on the pump control panel.

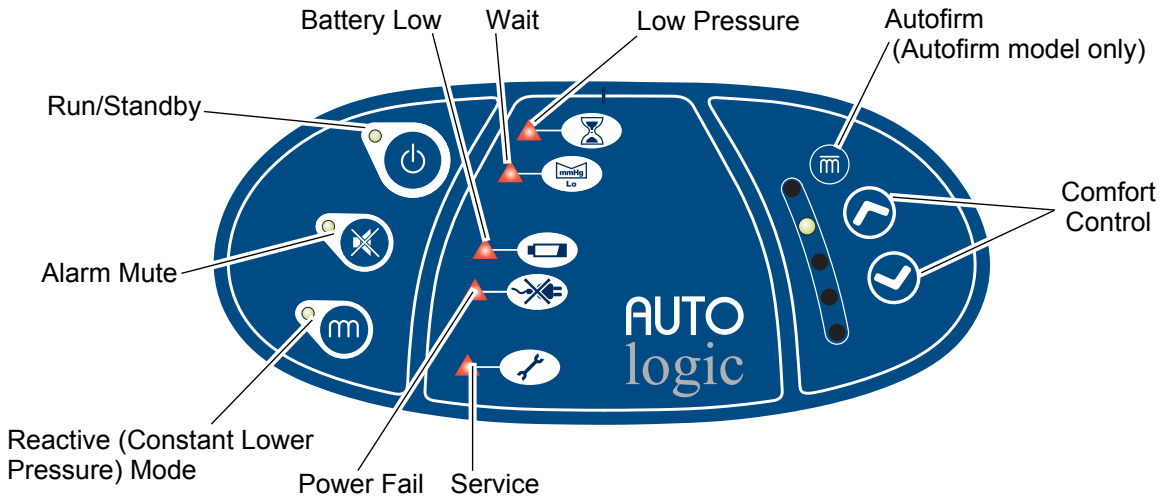


Figure 18 - Pump Control Panel

2 Test Equipment

2.1 To test/calibrate the pump unit correctly, the test equipment in Table 6 is required.

Note: *All test equipment must be calibrated to national or international standards.*

2.2 A tubeset connector must always connected to the pump. The pump will fail if it can not detect a mattress or seat cushion connected to it. The tubeset connector can be any of the following:

- The tubeset connected to an **Auto Logic** mattress replacement or overlay.
- The tubeset connected to an **Aura Logic** seat cushion.
- A 3-way pump tubeset adaptor (Table 6, Item 50).

Note: *The two batteries in the IR Interface Module (Table 6, Item 10) have a limited life. To conserve battery life, always switch off the IR Interface Module by disconnecting the 9-way D-type plug (on the end of the IR Interface Module cable) from the PC* ***when the testing is complete****.*

Table 6 - Pump Flow, Pressure and Function Test Equipment

Item	Test Equipment	Part Number
10	IR Interface Module	MIS216
20	Serial Communications Pack (includes item 60 software)	507104
30	Laptop / Desktop PC running Microsoft® Windows	-
40	Flow / Pressure Rig, 3-26 ltr/min	PRE073
50	3-way Pump Tubeset Adaptor (Spares Item)	630105
60	Communicator software, version **04** or higher(a)	SERS001-04
70	'T' piece	151528
80	Tubing	SW393

a. Refer to Chapter 9 "Communicator Software"

3 Checking the Basic System Operation

3.1 Connect the pump to an **Auto Logic** mattress replacement or overlay, or **Aura Logic** seat cushion.

3.2 When the pump is switched on at the mains/power supply or a battery pack is connected, a Built-In Self-Test (BIST) routine runs. The BIST routine is as follows (Refer to Figure 18):

3.2.1 The green indicator on the front of the pump illuminates.

3.2.2 After approximately one second, the green indicator on the front of the pump extinguishes, and the sounder "beeps" twice.

3.2.3 All the indicators on the pump control panel and the front case remain extinguished.

3.2.4 The duration of the BIST routine is approximately 30 seconds.

3.2.5 If the Run/Standby button is pressed during the BIST routine, the Run/Standby indicator illuminates immediately, and at the end of the BIST routine the pump changes to Run mode (Refer to Para 3.3). Otherwise the pump enters Standby mode.

3.3 At the end of the BIST routine, if the pump is not already in the Run mode, press the Run/Standby button on the pump control panel to start the Run sequence, as follows:

3.3.1 The green indicator on the front case and the Wait and Comfort indicators on the pump control panel illuminate immediately.

3.3.2 The Run/Standby indicator quickly flashes on - off - on, and then remains illuminated.

3.4 Allow approximately seven minutes for the mattress overlay, 15 minutes for the mattress replacement or three minutes for the seat cushion to inflate fully.

3.5 The amber Wait indicator extinguishes once the mattress/seat is fully inflated.

4 Checking the Pump Pressures without a Computer

4.1 Plug in and switch on the mains/power supply to the pump.

4.2 The BIST routine runs for approximately 20 seconds (Refer to Page 42, Section 3).

Note: *Do NOT press the* ***Run/Standby*** *button on the control panel during the BIST routine.*

4.3 Connect the 3-way pump tubeset adaptor (Table 6, Item 50) to the pump (Refer to Figure 19).

4.4 Connect the flow/pressure rig (Table 6, Item 40) to the static feed “C” on the 3-way pump tubeset adaptor. Make sure that the two alternating feeds “A” and “B” on the 3-way pump tubeset adaptor are blanked off (Refer to Figure 19).

4.5 Press the **Run/Standby** button on the pump to start the pump.

4.6 Fully open the valve on the flow/pressure rig.

4.7 After a couple of seconds at free flow, close the valve on the flow/pressure rig to create back pressure on the static feed “C”.

4.8 The reading on the pressure gauge should rise and stabilise.

Note: *Do not check the actual pressure gauge reading.*

4.9 The back pressure causes the pump to switch the air flow switch from the static feed “C” to the alternating feed “A”. When this occurs, connect the flow/pressure rig to the alternating feed “A” on the 3-way pump tubeset adaptor. Make sure that the static feed “C” and the other alternating feed “B” on the 3-way pump tubeset adaptor are blanked off.

4.10 Fully open the valve on the flow/pressure rig.

4.11 After a couple of seconds at free flow, close the valve on the flow/pressure rig to create back pressure on the alternating feed “A”.

4.12 The reading on the pressure gauge should rise and stabilise. Check that the pressure gauge reading is 50±10 mmHg:

4.12.1 If the pressure gauge reading is within ±10 mmHg of 50 mmHg, then continue the test at Para 4.13.

4.12.2 If the pressure gauge reading is ***NOT*** within ±10 mmHg of 50 mmHg, then carry out the procedure to re-calibrate the pressure transducer (Refer to Page 62, Section 12).

4.13 The back pressure causes the pump to switch the air flow switch from the alternating feed “A” to the alternating feed “B”. When this occurs, connect the flow/pressure rig to the alternating feed “B” on the 3-way pump tubeset adaptor. Make sure that the static feed “C” and the other alternating feed “A” on the pump manifold assembly are blanked off.

4.14 Fully open the valve on the flow/pressure rig.

4.15 After a couple of seconds at free flow, close the valve on the flow/pressure rig to create back pressure on the alternating feed “B”.

4.16 The reading on the pressure gauge should rise and stabilise. Check that the pressure gauge reading is 25±10 mmHg:

4.16.1 If the pressure gauge reading is within ±10 mmHg of 25 mmHg, then the pump pressures are correct, and the test has passed. Go to Para 4.17.

4.16.2 If the pressure gauge reading is ***NOT*** within ±10 mmHg of 25 mmHg, then carry out the procedure to re-calibrate the pressure transducer (Refer to Page 62, Section 12).

4.17 Switch off the mains/power supply to the pump.

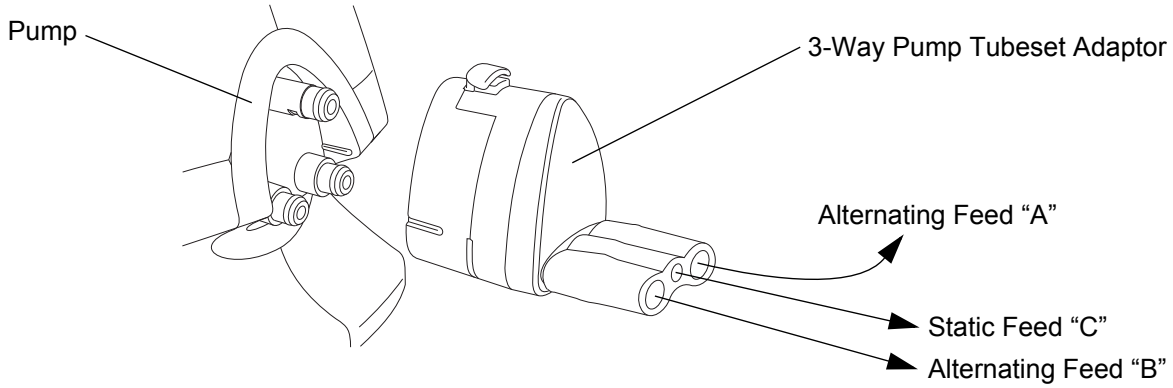


Figure 19 - 3-Way Pump Tubeset Adaptor

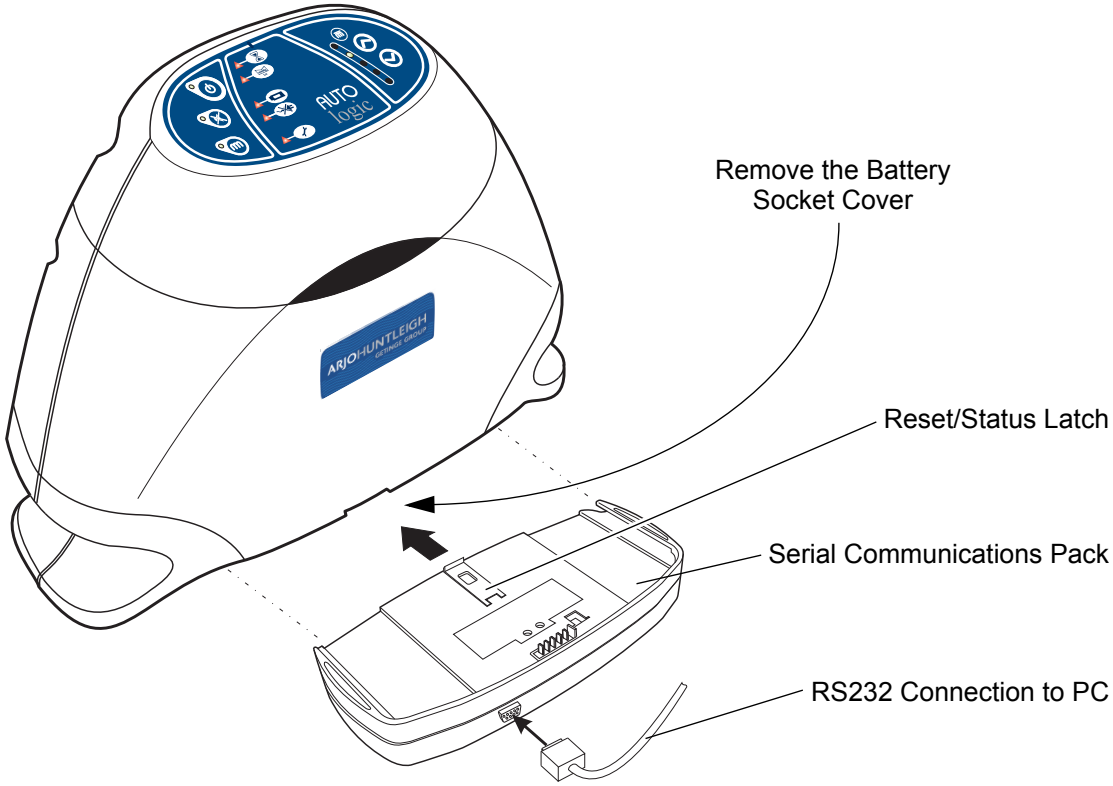
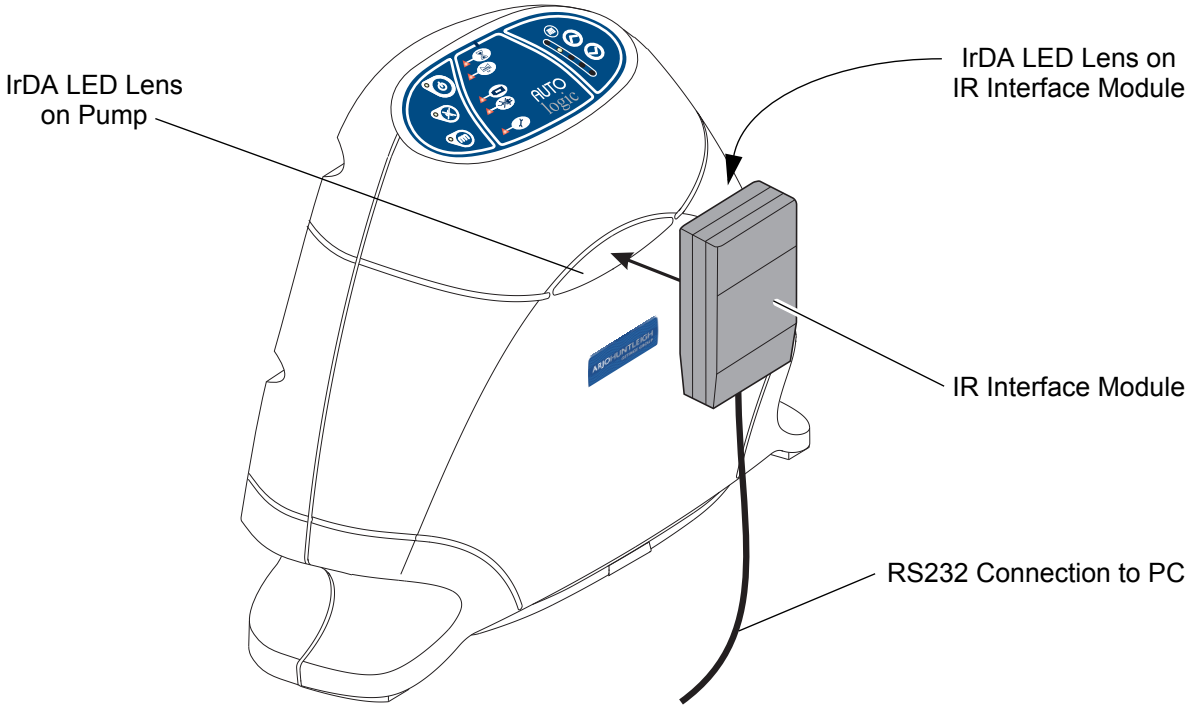


Figure 20 - Installing the Serial Communications Pack



Note: Make sure the IR Interface Module and Pump are facing each other, and as close as possible.

Figure 21 - Installing the IR Interface Module

5 Connecting the Pump to a Personal Computer (PC)

Laptop / Desktop PC

To provide extra monitoring and control of the pump during servicing, the pump must be connected to either a laptop or desktop PC running Microsoft® Windows XP (Table 6, Item 30).

The Communicator software (Table 6, Item 60) is installed and run on the computer, which sets up a Windows Graphical User Interface on the computer. The different menus and tabs provide full user control of the pump.

Computer Communication

The connection between the pump and the PC (laptop or desktop) can be either of the following:

- Serial Communications Pack (Table 6, Item 20). The Pack is installed directly onto the bottom of the pump in place of a standard battery pack. The Pack features an RS232 communications port which connects to the PC
- RS232 port via the supplied serial cable (and USB to RS232 adaptor if required). To install the Serial Communications Pack, refer to Para 5.2 below.
- IR Interface Module (Table 6, Item 10). The IR Interface Module is a free-standing unit, and connects to an RS232 communications port on the PC via the supplied serial cable (and USB to RS232 adaptor if required) and to the pump via an infrared link. To install the IR Interface Module, refer to Para 5.4 below.

Installing the USB to RS232 Adaptor

5.1 For PCs and laptops without an RS232 port, a USB to RS232 adaptor is supplied to add a virtual serial Com port. The device can be used with both the Serial Communications Pack or the IR Interface Module.

5.1.1 Power on the PC or laptop which is to be used with the adaptor and allow Microsoft® Windows to start up.

5.1.2 Connect the USB to RS232 Adaptor to one of the PC USB ports. After a few seconds, the **Found New Hardware Wizard** opens a dialogue. Click **Cancel** to exit the wizard.

5.1.3 Insert the USB to Serial Adaptor installation CD into the PC DVD/CD-ROM drive.

5.1.4 Use Microsoft® Windows Explorer or My Computer to navigate to the CD ROM drive and open the folder containing the drivers. In that folder, open the Windows drivers folder and double click the **Driver Installer** file. The InstallShield Wizard appears:

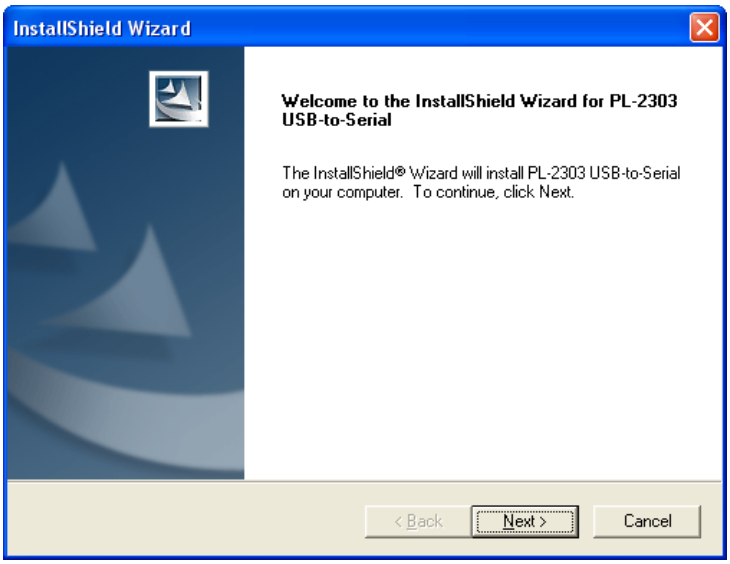

InstallShield Wizard
Welcome to the InstallShield Wizard for PL-2303 USB-to-Serial
The InstallShield® Wizard will install PL-2303 USB-to-Serial on your computer. To continue, click Next.
< Back
Next >
Cancel

Figure 22 - Install USB to Serial adaptor software

5.1.5 Click **Next** to continue. The installation will run automatically. When finished, the complete InstallShield wizard window appears.

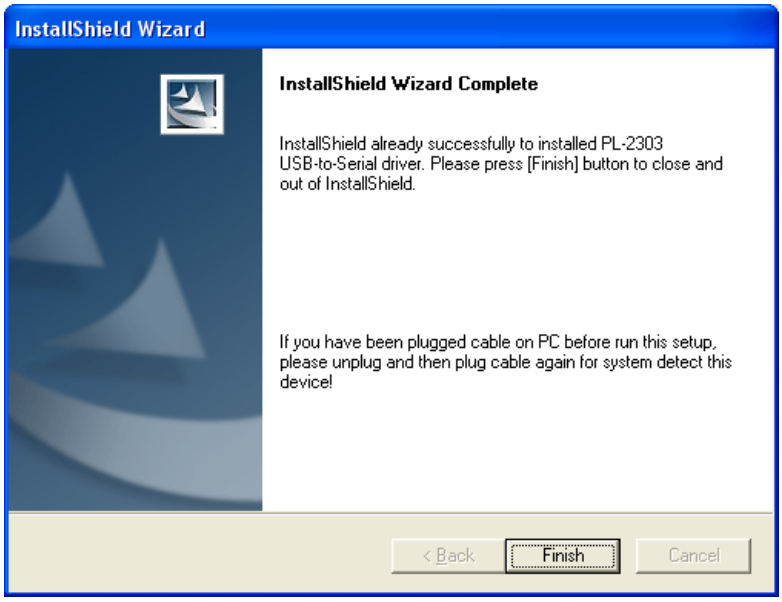

InstallShield Wizard
InstallShield Wizard Complete
InstallShield already successfully to installed PL-2303 USB-to-Serial driver. Please press [Finish] button to close and out of InstallShield.
If you have been plugged cable on PC before run this setup, please unplug and then plug cable again for system detect this device!
< Back
Finish
Cancel

Figure 23 - Installation complete

5.1.6 Click **Finish** to complete the installation.

5.1.7 Microsoft® Windows automatically assigns resources to the new virtual Com port.

5.1.8 To confirm installation and view the port settings, go to the **Control Panel**, select **System** and **Device Manager**. Click **Ports** to expand the view.

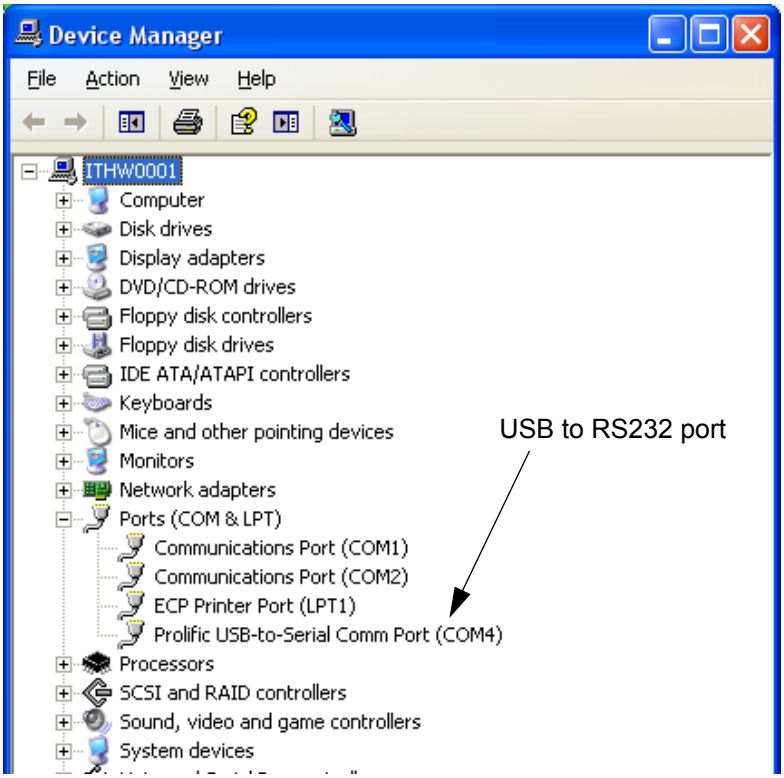


Figure 24 - Device Manager

5.1.9 The example in Figure 24 lists the built-in serial ports Com1 and Com2, plus the new USB virtual port Com4.

Note: *Different PCs may display different hardware devices and properties.*

5.2 Installing the Serial Communications Pack (Refer to Figure 20):

5.2.1 Make sure the PC is switched off.

5.2.2 Connect the 9-way D-type RS232 plug on the end of the Serial Communications Pack cable to the serial port on the PC. Alternatively, connect the USB to RS232 adaptor to one of the PC USB ports and connect the RS232 cable to that.

5.2.3 Switch on the PC. During its power-up initialisation routine, the PC will recognise that the Serial Communications Pack is connected to it.

5.2.4 Remove the battery socket cover from the base of the pump.

5.2.5 From the front of the pump, slide the Serial Communications Pack over the guides on the base of the pump, and click into place.

5.3 Removing the Serial Communications Pack from the pump (Refer to Figure 20):

5.3.1 Depress the Reset/Status Latch at the rear of the pump/battery pack.

5.3.2 Slide the Serial Communications Pack out from the pump base, towards the front.

5.3.3 Install the battery socket cover onto the base of the pump.

5.4 Installing the IR Interface Module (Refer to Figure 21):

5.4.1 Make sure the PC is switched off.

5.4.2 Connect the 9-way D-type RS232 plug on the end of the IR Interface Module cable to the serial port on the PC. Alternatively, connect the USB to RS232 adaptor to one of the PC USB ports and connect the RS232 cable to that.

5.4.3 Switch on the PC. During its power-up initialisation routine, the PC will recognise that the IR Interface Module is connected to it.

5.4.4 Place the IR Interface Module in front of the pump, such that the small clear plastic window on the front of each unit (covering the infrared transmitter and receiver) face each other, and are as close together as possible.

Note: *The distance between the two units should be a **maximum** of 0.3m (1 foot) for optimum infrared data transmission.*

Note: *The two batteries in the IR Interface Module (Table 6, Item 10) have a limited life. To conserve the battery life, always switch off the power to the IR Interface Module by disconnecting the 9-way D-type plug (on the end of the IR Interface Module cable) from the PC **when the testing is complete**.*

6 Running the Communicator Software

6.1 Install the Communicator software (Table 6, Item 60) on the PC (Refer to Chapter 9 “Communicator Software”).

6.2 Install the Serial Communications Pack (Table 6, Item 20) or the IR Interface Module (Table 6, Item 10) onto the PC and the pump (Refer to Page 46, Section 5).

6.3 Double-click the **Communicator** icon on the desktop of the PC. A “welcome” dialog box is briefly displayed, followed by the application startup dialog box (Refer to Figure 25).

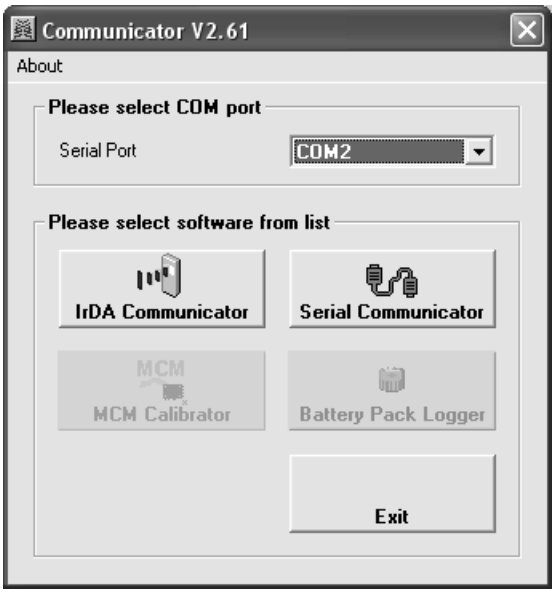


Figure 25 - Communicator Software - Application Start up Screen

6.4 Select the Serial port on the PC to which the IR Interface Module or the Serial Communications Pack is connected, using the **Please select COM port** drop-down menu.

Note: *If the PC has an built-in RS232 port, COM2 or COM1 will normally be selected. If the USB adaptor is used, a higher port number will probably be required. If in doubt, refer to Figure 24 to confirm the available system resources.*

6.5 There are five buttons on the **Please select software from list**:

- **IrDA Communicator**. Clicking this button starts the Communicator software running, using the IR Interface Module (Table 6, Item 10) to connect the pump to the PC.
- **Serial Communicator**. Clicking this button starts the Communicator software running, using the Serial Communications Pack (Table 6, Item 20) to connect the pump to the PC.
- **MCM Calibrator**. Do ***NOT*** click this button. This facility is not used during the service.
- **Battery Pack Logger**. Do ***NOT*** click this button. This facility is not used during the service.
- **Exit**. Clicking this button will close the Communicator software.

6.6 To start the Communicator software using the Serial Communications Pack, do the following:

6.6.1 Click the **Serial Communicator** button on the **Please select software from list**.

6.6.2 The **No command list loaded** dialog box is displayed (Refer to Figure 26).

6.6.3 Make sure that the top right of the dialog box shows:

- The **File Version: SERS001-XX**, where "**XX**" is the version number, and must be "**02**" higher.
- The **Serial Communicator** icon .

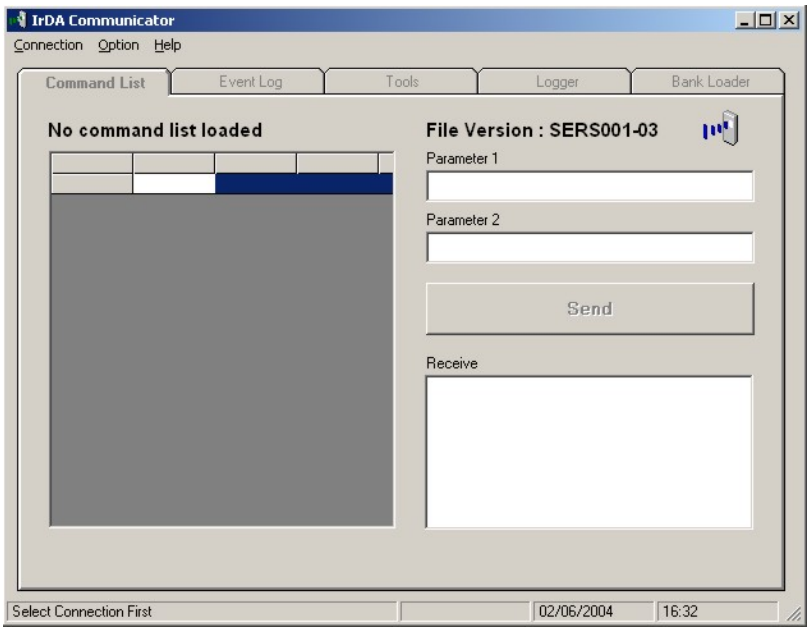


Figure 26 - Communicator Software - No Command List Loaded - Serial Communicator

6.7 To start the Communicator software using the IR Interface Module, do the following:

6.7.1 Click the **IrDA Communicator** button on the **Please select software from list**.

6.7.2 The **No command list loaded** dialog box is displayed (Refer to Figure 27).

6.7.3 Make sure that the top right of the dialog box shows:

- The **File Version: SERS001-XX**, where "**XX**" is the version number, and must be "**02**" or higher.
- The **IrDA Communicator** icon .

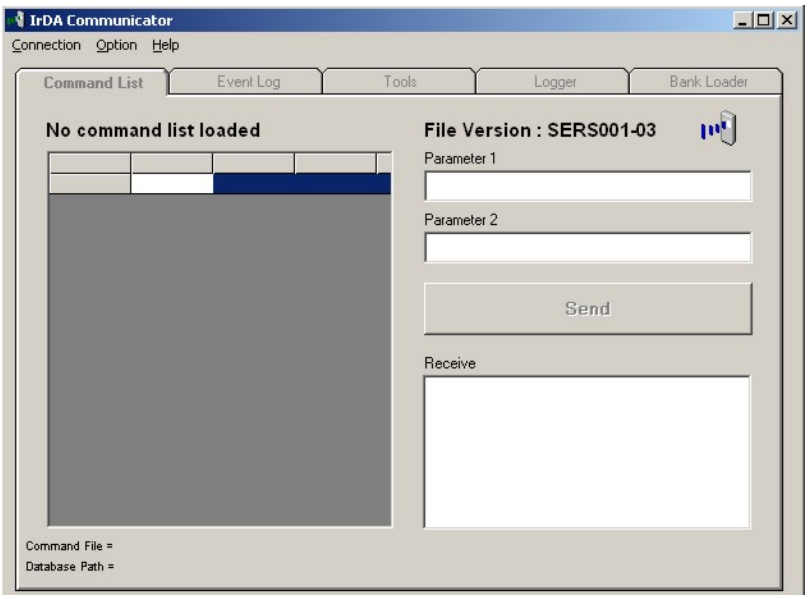


Figure 27 - Communicator Software - No Command List Loaded - IrDA Communicator

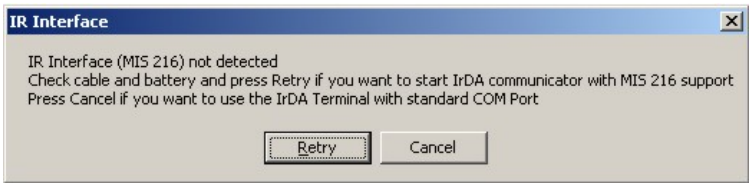

IR Interface
IR Interface (MIS 216) not detected
Check cable and battery and press Retry if you want to start IrDA communicator with MIS 216 support
Press Cancel if you want to use the IrDA Terminal with standard COM Port
Retry
Cancel

Figure 28 - Communicator Software - IR Interface Not Detected

6.8 When you click the **IrDA Communicator** button (Refer to Para 6.7, above), if the **IR Interface Not Detected** dialog box (Refer to Figure 28) is displayed instead of the **No command list loaded** dialog box (Refer to Figure 27), do the following:

6.8.1 Click **Cancel** on the **IR Interface Not Detected** dialog box.

6.8.2 The **No command list loaded (Serial Communicator)** dialog box is displayed (Refer to Figure 26).

Note: *If the Communicator software can not detect the IR Interface Module, it assumes the pump is connected via the **Serial Communicator**.*

6.8.3 On the **No command list loaded** dialog box, click **Connection**, then **Exit**.

6.8.4 The application startup dialog box is then displayed (Refer to Figure 25).

6.8.5 Select the other RS232 **COM** port on the PC, as detailed in Para 6.4.

6.8.6 If **COM1** was selected previously, select **COM2** this time.

6.8.7 Click the **IrDA Communicator** button to restart the Communicator software using the IR Interface Module (Refer to Para 6.7, above).

6.8.8 If the **IR Interface Not Detected** dialog box is still displayed, then:

6.8.8.1 Repeat the procedure in Para 6.8.1 to Para 6.8.4, above.

6.8.8.2 Check and/or replace the batteries in the IR Interface Module.

6.8.8.3 Then click the **IrDA Communicator** button (Refer to Para 6.8.7).

6.9 When the correct **No command list loaded** dialog box (Refer to Figures 26 and 27) has been successfully loaded, click **Connection**, then click **Auto Logic** (Refer to Figure 29).

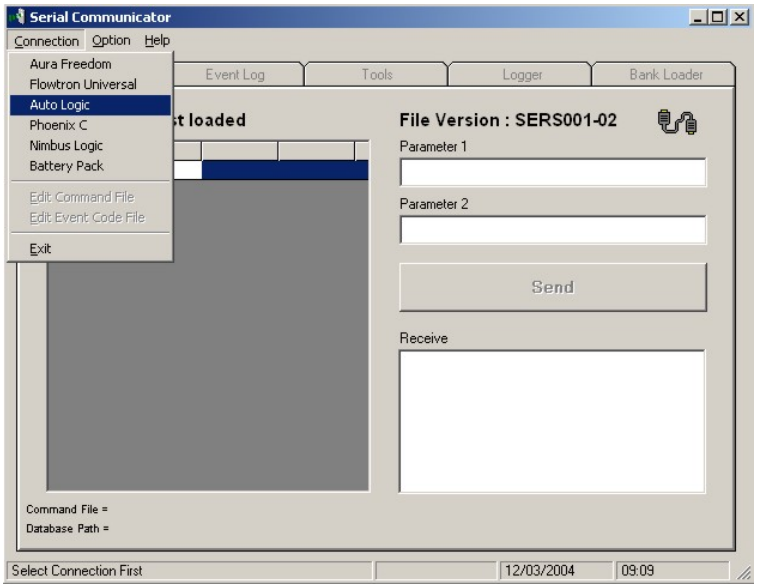


Figure 29 - Communicator Software - Selection of Auto Logic Command List

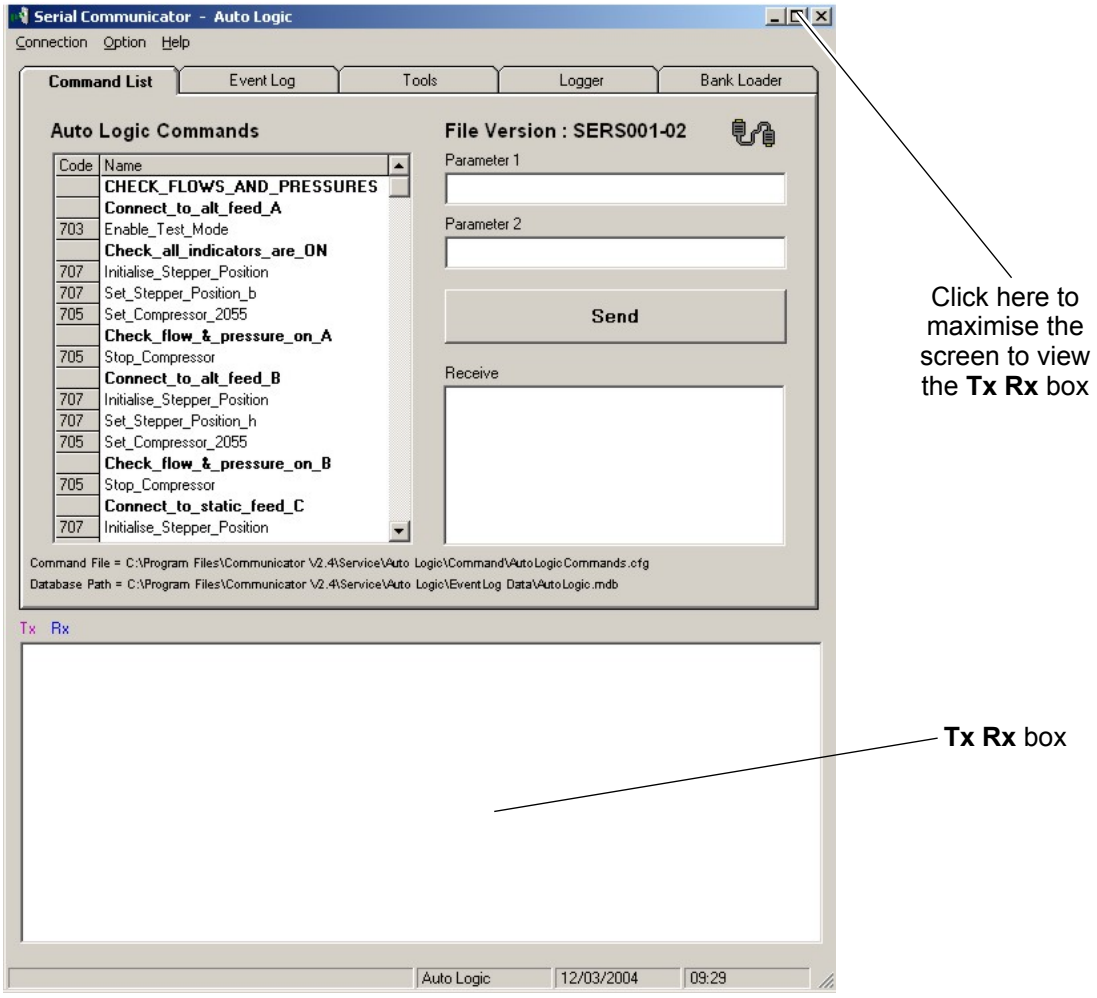


Figure 30 - Communicator Software - Auto Logic Commands with Screen Maximised

6.10 The menu of **Auto Logic Commands** is then displayed (Refer to Figure 30).

6.11 Before starting any test procedure using the Communicator software, ***always*** click the middle button at the top right of the dialog box to maximise the screen (Refer to Figure 30).

Note: *You must always "maximise" the screen to view the **Tx Rx** box at the bottom of the dialog box (the **Tx Rx** box is hidden in the "normal" dialog box view). The **Tx Rx** box displays all commands sent to the pump, all parameters sent with each command and all responses received from the pump. This makes it easier to carry out the testing.*

7 Executing Commands and Test Sequences on the Command Menu

7.1 Run the Communicator software on the PC (Refer to Page 49, Section 6).

7.2 Make sure that the top right of the dialog box shows the **File Version: SERS001-XX**, where "**XX**" is the version number, and must be "**02**" or higher.

7.3 Make sure **Auto Logic** is selected on the **Connection** drop-down menu, and the **Auto Logic Commands** menu is displayed.

7.4 Make sure that the screen is "maximised" (Refer to Para 6.11, above).

Note: *Each time the **Auto Logic** pump is powered up, the default connection to the PC is via the Serial Communications Pack. If you want to connect the pump to the PC via the IR Interface Module, then carry out the procedure to make the pump operate via the IR Interface Module (Refer to Page 56, Section 8).*

Executing Single Commands

7.5 The menu of **Auto Logic Commands** is split into two columns (Refer to Figure 30):

- **Code**. This is the 3-digit command code sent to the pump.
- **Name**. This is a description of the command for the service engineer.

7.6 Each command can be one of two types:

- If there is a 3-digit number in the **Code** column, and there is "plain" text in the **Name** column, then this is a command which is sent to the pump e.g. 703 - Enable_Test_Mode.
- If the **Code** column is blank, and there is **bold** text in the **Name** column, then this is not a pump command, but a comment or instruction to the service engineer e.g. **Check_pressure_on_gauge**.

7.7 To send a command to the pump:

7.7.1 Click the appropriate command on the left side of the dialog box e.g. **703 - Enable_Test_Mode**.

7.7.2 If necessary, add or change any parameters on the right side of the dialog box above the **Send** button.

Note: *Do **not** add or change any parameters unless the test procedure says to do so.*

7.7.3 Click **Send** to send the command to the pump.

7.7.4 The command and its parameters are displayed in the **Tx Rx** box.

7.7.5 Any response from the pump is displayed in the **Receive** part of the dialog box, and also in the **Tx Rx** box.

7.7.6 If there is no immediate response from the pump and the **Send** button is "greyed out", then it means that there has been a communication error between the PC and the pump. If you look at the **Tx Rx** box, you will see 10 attempts to send the command to the pump. After 10 failed attempts, a **Communication Error** dialog box is displayed (Refer to Figure 31). Do the following:

7.7.6.1 Check that the pump is powered up and in **Standby**.

7.7.6.2 Check the connections between the PC and the IR Interface Module or Serial Communications Pack.

7.7.6.3 Select the other RS232 **COM** port on the PC, as follows:

- Click **Connection**, then click **Exit** on the drop-down menu.
- The application startup dialog box is then displayed (Refer to Figure 25).
- Select the other RS232 **COM** port on the PC, as detailed in Para 6.4.

Note: *If **COM1** was selected previously, select **COM2** this time.*

- Click the Serial **Communicator** or **IrDA Communicator** button to restart the Communicator software.

7.7.6.4 If the IR Interface Module is being used:

- Check the two batteries in the IR Interface Module.
- Make sure that there are no obstructions between the IR Interface Module and the front of the pump, and they are less than 0.3m (1 foot) apart (Refer to Figure 21).

7.7.6.5 Re-send the command to the pump.

Figure 31 - Communicator Software - Communication Error

7.7.7 When the command is successful, **SUCCESS** is displayed in the **Receive** part of the dialog box e.g. **703 - SUCCESS**, where **703** is the command that was sent to the pump.

7.7.8 If you try and send a command which is not allowed by the pump (e.g if you try to send certain commands when the pump is not in **Test Mode**), the **Receive** part of the dialog box will show **NOT_AVAILABLE** e.g. **501 = NOT_AVAILABLE**, where **501** is the command sent to the pump.

7.7.9 When you send command **707 - Set_Stepper_Position** to the pump, ***you must listen to the movement of the stepper motor in the pump manifold assembly***. You must wait for the stepper motor to stop turning before you attempt to send another command to the pump.

Executing Test Sequences

7.8 On the Communicator software on the PC, the menu of **Auto Logic Commands** contains:

- General pump commands at the bottom of the menu. These are grouped into various sections e.g. **SERVICE**, **TESTING**, etc.
- Specific test “sections” at the top of the menu e.g. **CHECK_FLOWS_AND_PRESSURES**. These contain groups of general pump commands to run each test, and service engineer comments which are not sent to the pump (Refer to Figure 30).

7.9 To run a specific test sequence from the menu of **Auto Logic Commands**:

7.9.1 The service manual will refer to the name of the test sequence in the menu of **Auto Logic Commands**.

7.9.2 Scroll through the menu of **Auto Logic Commands** to find the relevant test section at the top of the menu e.g. **CHECK_FLOWS_AND_PRESSURES**.

7.9.3 The pump commands for each test must be executed in the same order as they appear in the **Auto Logic Commands** menu, starting with the first command under the test title, and in the same order as in the test procedure in the service manual.

Note: *Make sure that each command has been executed successfully before attempting to select and execute the next command in the test sequence.*

7.9.4 To make the testing easier to follow, if a particular pump command has to be repeated in the service manual test procedure, then the specific pump command will appear more than once in the test section of the **Auto Logic Commands** menu.

8 Operating the Pump from a PC via the IR Interface Module

Each time the **Auto Logic** pump is powered up, the default connection to the PC is via the Serial Communications Pack. If you want to connect the pump to the PC via the IR Interface Module, then carry out the following procedure to make the pump operate via the IR Interface Module.

Note: *This function is not available on all versions of software and control PCBs.*

8.1 Do **NOT** switch on the mains/power supply to the pump until instructed to do so.

8.2 Connect the pump to the PC using the IR Interface Module (Refer to Page 46, Section 5).

Note: *Make sure the IR Interface Module is positioned correctly in front of the pump.*

8.3 Run the Communicator software on the PC, using the IR Interface Module only (Refer to Page 49, Section 6).

Note: *You **MUST** click **IrDA Communicator** on the **Application Startup Screen** (Refer to Para 6.7 and Figure 25, above).*

8.4 Make sure that the top right of the dialog box shows:

- The **File Version: SERS001-XX**, where "**XX**" is the version number, and must be "**02**" or higher.
- The **IrDA Communicator** icon .

8.5 Make sure **Auto Logic** is selected on the **Connection** drop-down menu, and the **Auto Logic Commands** menu is displayed.

8.6 Plug in and switch on the mains/power supply to the pump. The Built-In Self-Test (BIST) routine will immediately start running on the pump, and will run for approximately 20 seconds.

Note: *Do NOT press the **Run/Standby** button on the control panel during the BIST routine.*

8.7 During this power-up BIST routine, select and send ***any*** command from the menu of **Auto Logic Commands** e.g. **703 - Enable_Test_Mode** (Refer to Page 54, Section 7). Ignore any responses received back from the pump, since the pump is running the BIST routine.

Note: *It does not matter what command is sent, provided that the command is sent **before** the BIST routine has finished.*

8.8 At the end of the BIST routine, the following is displayed in the **Tx Rx** box:

IrDA Phy Selected

STANDBY

8.9 The pump is now set up to communicate via the IR Interface Module.

Note: *The connection to the PC will remain via the IR interface module until the pump is switched off.*

8.10 If the pump is not communicating with the PC via the IR Interface Module, do the following:

8.10.1 Switch off the pump.

8.10.2 After a few seconds, repeat the procedure detailed in Para 8.6 to Para 8.9.

8.11 If the pump is still not communicating with the PC via the IR Interface Module, do the following:

8.11.1 Check the connections between the PC and the IR Interface Module.

8.11.2 Select the other RS232 **COM** port on the PC, as follows:

8.11.2.1 Click **Connection**, then click **Exit** on the drop-down menu.

8.11.2.2 The application startup dialog box is then displayed (Refer to Figure 25).

8.11.2.3 Select the other RS232 **COM** port on the PC, as detailed in Para 6.4.

Note: *If **COM1** was selected previously, select **COM2** this time.*

8.11.2.4 Click **IrDA Communicator** to restart the Communicator software.

8.11.3 Finally, check the following:

- Make sure that there are no obstructions between the IR Interface Module and the front of the pump, and they are less than 0.3m (1 foot) apart (Refer to Figure 21).
- The two batteries in the IR Interface Module.

8.11.4 Make sure that the command was sent to the pump ***during*** the BIST routine (Refer to Para 8.7, above).

Note: *An alternative method of connecting the pump via the IR Interface Module is to install a battery pack onto the pump. This automatically forces the pump to connect via the IR Interface Module.*

9 Closing the Communicator Software

Figure 32 - Communicator Software - Closing the Software

9.1 To close the Communicator software, do the following:

9.1.1 Click **Connection**, then click **Exit** on the drop-down menu.

9.1.2 The application startup dialog box is then displayed (Refer to Figure 32).

9.1.3 Click **Exit**.

9.1.4 The Communicator software is closed.

9.2 If you try to close the Communicator software by closing the application, you are prevented from doing so until the application ends (Refer to Figure 33). Always carry out the procedure detailed in Para 9.1, above.

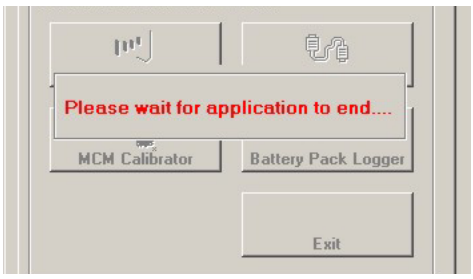


Figure 33 - Communicator Software - attempting to force closure

10 Checking the Pump Pressures and Free Flows with a Computer

10.1 If you are operating the pump from a PC via the IR Interface Module, do **NOT** switch on the mains/power supply to the pump until instructed to do so.

10.2 Connect the pump to a PC using either the Serial Communications Pack or the IR Interface Module (Refer to Page 46, Section 5).

10.3 Run the Communicator software on the PC (Refer to Page 49, Section 6).

10.4 Make sure that the top right of the dialog box shows the **File Version: SERS001-XX**, where "**XX**" is the version number, and must be "**02**" or higher.

10.5 Make sure **Auto Logic** is selected on the **Connection** drop-down menu, and the **Auto Logic Commands** menu is displayed.

10.6 Make sure the screen is maximised, so that the **Tx Rx** box can be viewed (Refer to Figure 30).

10.7 To connect the mains/power supply to the pump, do the following:

10.7.1 If the Serial Communications Pack is being used:

10.7.1.1 Plug in and switch on the mains/power supply to the pump.

10.7.1.2 The power-up BIST routine will run for approximately 20 seconds (Refer to Page 42, Section 3).

Note: *Do NOT press the **Run/Standby** button on the control panel during the power-up BIST routine.*

10.7.2 If the IR Interface Module is being used, carry out the procedure to connect the pump to the PC via the IR Interface Module (Refer to Page 56, Section 8).

10.8 Connect the 3-way pump tubeset adaptor (Table 6, Item 50) to the pump (Refer to Figure 34).

10.9 Connect the flow/pressure rig (Table 6, Item 40) to the alternating feed **A** on the 3-way pump tubeset adaptor. Make sure that the other alternating feed **B** and the static feed **C** on the 3-way pump tubeset adaptor are blanked off (Refer to Figure 34).

10.10 On the Communicator software, scroll through the menu of **Auto Logic Commands** to the section heading **CHECK_FLOWS_AND_PRESSURES** (Refer to Page 54, Section 7).

10.11 Send the command **703 - Enable_Test_Mode**, to put the pump into test mode.

10.12 Check that all the indicators on the top and front of the pump are illuminated.

10.13 Send the command **707 - Initialise_Stepper_Position**. Listen to the movement of the stepper motor in the pump manifold assembly, and wait for it to stop turning before you attempt to send the next command to the pump.

10.14 Send the command **707 - Set_Stepper_Position_b**.

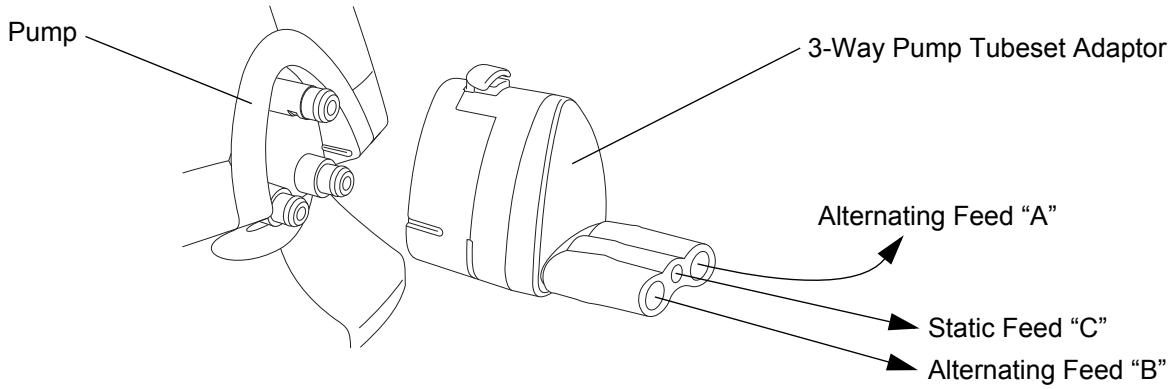


Figure 34 - 3-Way Pump Tubeset Adaptor

10.15 Send the command **705 - Set_Compressor_2055**.

10.16 Fully open the valve on the flow/pressure rig.

10.17 The reading on the flow meter should rise and stabilise. Check that the flow meter reading is greater than **8 lpm** (litres per minute):

10.17.1 If the flow is greater than **8 lpm**, then continue the test at Para 10.18.

10.17.2 If the flow is less than **8 lpm**, then the compressor is faulty.

10.18 After measuring the flow rate, close the valve on the flow/pressure rig to create back pressure on the alternating feed **A**.

10.19 The reading on the pressure gauge should rise and stabilise. Check that the pressure gauge reading is greater than **100 mmHg**:

10.19.1 If the pressure gauge reading is greater than **100 mmHg**, then continue the test at Para 10.20.

10.19.2 If the pressure gauge reading is less than **100 mmHg**, then the compressor is faulty.

10.20 Send the command **705 - Stop_Compressor**.

10.21 Connect the flow/pressure rig to the alternating feed **B** on the 3-way pump tubeset adaptor. Make sure that the other alternating feed **A** and the static feed **C** on the 3-way pump tubeset adaptor are blanked off.

10.22 Send the command **707 - Initialise_Stepper_Position**.

10.23 Send the command **707 - Set_Stepper_Position_h**.

10.24 Send the command **705 - Set_Compressor_2055**.

10.25 Fully open the valve on the flow/pressure rig.

10.26 The reading on the flow meter should rise and stabilise. Check that the flow meter reading is greater than **8 lpm**:

10.26.1 If the flow is greater than **8 lpm**, then continue the test at Para 10.27.

10.26.2 If the flow is less than **8 lpm**, then the compressor is faulty.

10.27 After measuring the flow rate, close the valve on the flow/pressure rig to create back pressure on the alternating feed **B**.

10.28 The reading on the pressure gauge should rise and stabilise. Check that the pressure gauge reading is greater than **100 mmHg**:

10.28.1 If the pressure gauge reading is greater than **100 mmHg**, then continue the test at Para 10.29.

10.28.2 If the pressure gauge reading is less than **100 mmHg**, then the compressor is faulty.

10.29 Send the command **705 - Stop_Compressor**.

10.30 Connect the flow/pressure rig to the static feed **C** on the 3-way pump tubeset adaptor. Make sure that the two alternating feeds **A** and **B** on the 3-way pump tubeset adaptor are blanked off.

10.31 Send the command **707 - Initialise_Stepper_Position**.

10.32 Send the command **707 - Set_Stepper_Position_p**.

10.33 Send the command **705 - Set_Compressor_2055**.

10.34 Fully open the valve on the flow/pressure rig.

10.35 The reading on the flow meter should rise and stabilise. Check that the flow meter reading is greater than **8 lpm**:

10.35.1 If the flow is greater than **8 lpm**, then continue the test at Para 10.36.

10.35.2 If the flow is less than **8 lpm**, then the compressor is faulty.

10.36 After measuring the flow rate, close the valve on the flow/pressure rig to create back pressure on the static feed **C**.

10.37 The reading on the pressure gauge should rise and stabilise. Check that the pressure gauge reading is greater than **80 mmHg**:

10.37.1 If the pressure gauge reading is greater than **80 mmHg**, then continue the test at Para 10.38.

10.37.2 If the pressure gauge reading is less than **80 mmHg**, then the compressor is faulty.

10.38 Send the command **705 - Stop_Compressor**.

10.39 Send the command **704 - Disable_Test_Mode** to put the pump into standby mode.

10.40 Open and close the valve on the flow/pressure rig to release any back pressure that may be apparent.

10.41 Send the command **70A - Read_Pressure**.

10.42 Read the pressure value displayed in the **Receive** box. Check that the pressure value is **0.0 ± 5 mmHg**:

10.43 Switch off the mains/power supply to the pump.

11 Checking the Calibration of the Pressure Transducer

11.1 If you are operating the pump from a PC via the IR Interface Module, do **NOT** switch on the mains/power supply to the pump until instructed to do so.

11.2 Connect the pump to a PC using either the Serial Communications Pack or the IR Interface Module (Refer to Page 46, Section 5).

11.3 Run the Communicator software on the PC (Refer to Page 49, Section 6).

11.4 Make sure that the top right of the dialog box shows the **File Version: SERS001-XX**, where "**XX**" is the version number, and must be "**02**" higher.

11.5 Make sure **Auto Logic** is selected on the **Connection** drop-down menu, and the **Auto Logic Commands** menu is displayed.

11.6 Make sure the screen is maximised, so that the **Tx Rx** box can be viewed (Refer to Figure 30).

11.7 To connect the mains/power supply to the pump, do the following:

11.7.1 If the Serial Communications Pack is being used:

11.7.1.1 Plug in and switch on the mains/power supply to the pump.

11.7.1.2 The power-up BIST routine will run for approximately 20 seconds (Refer to Page 42, Section 3).

Note: *Do NOT press the **Run/Standby** button on the control panel during the power-up BIST routine.*

11.7.2 If the IR Interface Module is being used, carry out the procedure to connect the pump to the PC via the IR Interface Module (Refer to Page 56, Section 8).

11.8 Connect the 3-way pump tubeset adaptor (Table 6, Item 50) to the pump (Refer to Figure 34).

11.9 Connect the flow/pressure rig (Table 6, Item 40) to the alternating feed **A** on the 3-way pump tubeset adaptor. Make sure that the other alternating feed **B** and the static feed **C** on the 3-way pump tubeset adaptor are blanked off (Refer to Figure 34).

11.10 On the Communicator software, scroll through the menu of **Auto Logic Commands** to the section heading **CHECK_TRANSDUCER** (Refer to Page 54, Section 7).

11.11 Send the command **703 - Enable_Test_Mode**, to put the pump into test mode.

11.12 Check that all the indicators on the top and front of the pump are illuminated.

11.13 Send the command **707 - Initialise_Stepper_Position**. Listen to the movement of the stepper motor in the pump manifold assembly, and wait for it to stop turning before you attempt to send the next command to the pump.

11.14 Send the command **707 - Set_Stepper_Position_b**.

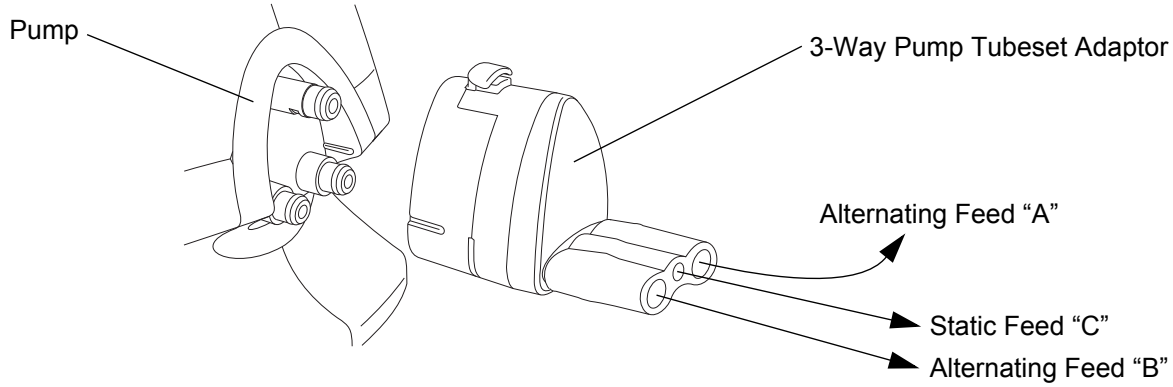


Figure 35 - 3-Way Pump Tubeset Adaptor

11.15 Send the command **705 - Set_Compressor_1455**.

11.16 Fully open the valve on the flow/pressure rig.

11.17 After a few seconds at free flow, close the valve on the flow/pressure rig to create back pressure on the alternating feed **A**.

11.18 The reading on the pressure gauge should rise and stabilise. Check that the pressure gauge reading is between **100 and 140 mmHg**:

11.18.1 If the pressure gauge reading is between **100 and 140 mmHg**, then continue the test at Para 11.19.

11.18.2 If the pressure gauge reading is ***NOT*** between **100 and 140 mmHg**, then do the following:

11.18.2.1 Select the command **705 - Set_Compressor_1455**, but do not send it to the pump.

11.18.2.2 Make small changes to the **Level** parameter of command **705**, by overwriting the values in the box.

Note: *An increase in the **Level** parameter will increase the pressure gauge reading.*

11.18.2.3 Send the command **705** to the pump.

11.18.2.4 Repeat Para 11.18.2.1 to Para 11.18.2.3 until the pressure gauge reading is between **100 and 140 mmHg**.

11.18.2.5 Continue the test at Para 11.19.

11.19 Make a note of the actual pressure gauge reading.

11.20 Send the command **70A - Read_Pressure**.

11.21 Compare the value of the pressure received from the pump in the **Receive** part of the dialog box on the PC against the value of the pressure shown on the pressure/flow rig:

11.21.1 If the two values are within **±5 mmHg** of each other, then continue the test at Para 11.22.

11.21.2 If the two values are ***NOT*** within **±5 mmHg** of each other, then carry out the procedure to re-calibrate the pressure transducer (Refer to Page 62, Section 12).

11.22 Send the command **705 - Stop_Compressor**.

11.23 Send the command **704 - Disable_Test_Mode** to put the pump into standby mode.

11.24 Switch off the mains/power supply to the pump.

12 Re-Calibrating the Pressure Transducer and Verifying the Pressures (Pumps Installed With 630400 PCB Assembly)

Note: *This procedure can only be carried out on pumps which have software version up to **V2.05** (Refer to Page 62, Checking the Software Version of the Pump, below).*

Note: *Do **NOT** connect the 3-way pump tubeset adaptor (Table 6, Item 50) to the pump until instructed to do so.*

Note: *This procedure is only applicable for pumps installed with the 630400 PCB assembly.*

12.1 If you are operating the pump from a PC via the IR Interface Module, do **NOT** switch on the mains/power supply to the pump until instructed to do so.

12.2 Connect the pump to a PC using either the Serial Communications Pack or the IR Interface Module (Refer to Page 46, Section 5).

12.3 Run the Communicator software on the PC (Refer to Page 49, Section 6).

12.4 Make sure that the top right of the dialog box shows the **File Version: SERS001-XX**, where "**XX**" is the version number, and must be "**02**" or higher.

12.5 Make sure **Auto Logic** is selected on the **Connection** drop-down menu, and the **Auto Logic Commands** menu is displayed.

12.6 Make sure the screen is maximised, so that the **Tx Rx** box can be viewed (Refer to Figure 30).

12.7 To connect the mains/power supply to the pump, do the following:

12.7.1 If the Serial Communications Pack is being used:

12.7.1.1 Plug in and switch on the mains/power supply to the pump.

12.7.1.2 The power-up BIST routine will run for approximately 20 seconds (Refer to Page 42, Section 3).

Note: *Do NOT press the **Run/Standby** button on the control panel during the power-up BIST routine.*

12.7.2 If the IR Interface Module is being used, carry out the procedure to connect the pump to the PC via the IR Interface Module (Refer to Page 56, Section 8).

12.8 On the Communicator software, scroll through the menu of **Auto Logic Commands** to the section heading **RE-CALIBRATE_TRANSDUCER** (Refer to Page 54, Section 7).

Checking the Software Version of the Pump

12.9 Send the command **801 - Read_Software_Version**.

12.10 Check the **Receive** part of the dialog box. There should be **801 = VX.XX**, where **X.XX** is the version number of the pump software:

12.10.1 If the version number is **2.02** or higher, then continue the following transducer recalibration procedure at Para 12.11.

12.10.2 If the version number is lower than **2.02**, then the following transducer re-calibration procedure can ***NOT*** be carried out.

Re-Calibrating the Pressure Transducer

12.11 Send the command **703 - Enable_Test_Mode**, to put the pump into test mode.

12.12 Send the command **707 - Initialise_Stepper_Position**. Listen to the movement of the stepper motor in the pump manifold assembly, and wait for it to stop turning before you attempt to send the next command to the pump.

12.13 Send the command **707 - Set_Stepper_Position_b**.

12.14 Send the command **70E - Calibrate**.

12.15 Send the command **70F - Auto_Balance**.

12.16 Wait until **WAITING** is displayed in the **Tx Rx** box.

12.17 Send the command **705 - Set_Compressor_1455**.

Note: *Make sure that the compressor is running and air is coming out of the pump outlet ports.*

12.18 Connect the 3-way pump tubeset adaptor (Table 6, Item 50) to the pump (Refer to Figure 36).

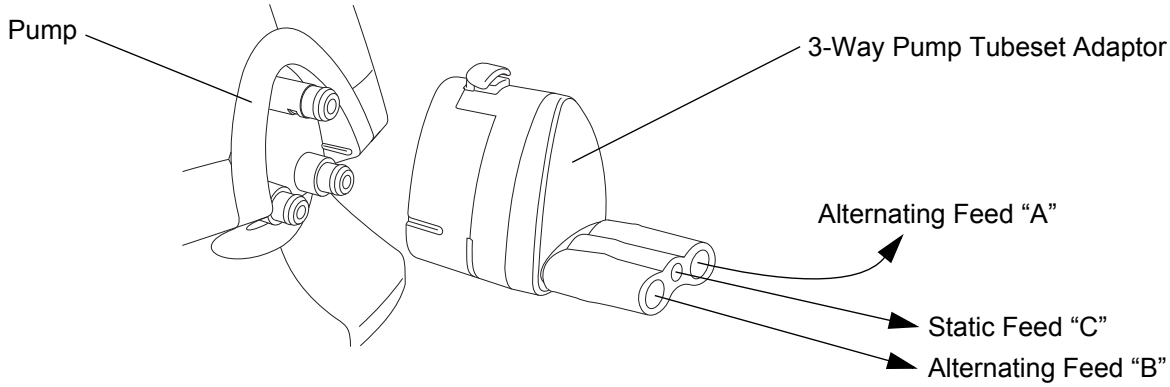


Figure 36 - 3-Way Pump Tubeset Adaptor

12.19 Connect the flow/pressure rig (Table 6, Item 40) to the alternating feed **A** on the 3-way pump tubeset adaptor. Make sure that the other alternating feed **B** and the static feed **C** on the 3-way pump tubeset adaptor are blanked off (Refer to Figure 36).

12.20 Fully open the valve on the flow/pressure rig.

12.21 After a few seconds at free flow, close the valve on the flow/pressure rig to create back pressure on the alternating feed **A**.

12.22 The reading on the pressure gauge should rise and stabilise. Check that the pressure gauge reading is approximately **110 - 130 mmHg**:

12.22.1 If the pressure gauge reading is approximately **110 - 130 mmHg**, then continue the test at Para 12.23.

12.22.2 If the pressure gauge reading is ***NOT*** approximately **110 - 130 mmHg**, then do the following:

12.22.2.1 Select the command **705 - Set_Compressor_1455**, but do not send it to the pump.

12.22.2.2 Make small changes to the **Level** parameter, by overwriting the value.

Note: *An increase in the **Level** parameter will increase the pressure gauge reading.*

12.22.2.3 Send the command **705 - Set_Compressor_1455** to the pump.

12.22.2.4 Repeat Para 12.22.2.1 to Para 12.22.2.3 until the pressure gauge reading is approximately **110 - 130 mmHg**.

12.22.2.5 Continue the test at Para 12.23.

Note: *Do not attempt to verify the pressure with command 70A while in the calibration routine, some parameters are calculated once the 'END CAL' function is executed and therefore the mid-values may be inaccurate.*

12.23 Make a note of the actual pressure gauge reading.

12.24 Execute command **710 - Auto_Gain**, as follows:

12.24.1 Select the command **710 - Auto_Gain**, but do not send it to the pump.

12.24.2 In the **Applied_Pressure** parameter box, overwrite the value with the actual pressure gauge reading from Para 12.23, above.

12.24.3 Send the command **710 - Auto_Gain** to the pump.

12.25 Wait until **WAITING** is displayed in the **Tx Rx** box.

12.26 Send the command **705 - Stop_Compressor**.

12.27 Open and close the valve on the flow/pressure rig to release any back pressure that may be apparent.

12.28 Send the command **70F - Auto_Balance**.

12.29 Wait until **WAITING** is displayed in the **Tx Rx** box.

12.30 Send the command **711 - Calibration_End**.

Verifying the Pressures

12.31 Check that the pressure gauge is reading **0 mmHg**.

12.32 Send the command **70A - Read_Pressure**.

12.33 Compare the value of the pressure received from the pump in the **Receive** part of the dialog box on the PC against the value of the pressure shown on the pressure/flow rig. The two values should be within **±5 mmHg** of each other.

12.34 Send the command **705 - Set_Compressor_1455**.

12.35 Fully open the valve on the flow/pressure rig.

12.36 After a few seconds at free flow, close the valve on the flow/pressure rig to create back pressure on the alternating feed **A**.

12.37 The reading on the pressure gauge should rise and stabilise. Check that the pressure gauge reading is approximately **110 - 130 mmHg**:

12.37.1 If the pressure gauge reading is approximately **110 - 130 mmHg**, then continue the test at Para 12.38.

12.37.2 If the pressure gauge reading is ***NOT*** approximately **110 - 130 mmHg**, then:

12.37.2.1 Repeat Para 12.22.2, above, to adjust the pressure gauge reading.

12.37.2.2 Continue the test at Para 12.38.

12.38 Make a note of the pressure gauge reading.

12.39 Send the command **70A - Read_Pressure**.

12.40 Compare the value of the pressure received from the pump in the **Receive** part of the dialog box on the PC against the value of the pressure shown on the pressure/flow rig:

12.40.1 If the two values are within **±5 mmHg** of each other, then continue the test at Para 12.46.

12.40.2 If the two values are ***NOT*** within **±5 mmHg** of each other, then continue the test at Para 12.41 to make a fine adjustment to the transducer calibration.

Making Fine Adjustments to the Transducer Calibration

12.41 Select the command **766 - Eng_Fine_Adjust**, but do not send it to the pump.

12.42 In the **Enter_Actual_Pressure** parameter box, overwrite the value with the actual pressure gauge reading from Para 12.38, above.

12.43 Send the command **766 - Eng_Fine_Adjust** to the pump.

12.44 Send the command **70A - Read_Pressure**.

12.45 Compare the value of the pressure received from the pump in the **Receive** part of the dialog box on the PC against the value of the pressure shown on the pressure/flow rig. The two values should be within **±5 mmHg** of each other.

End of Test

12.46 Send the command **705 - Stop_Compressor**.

12.47 Switch off the mains/power supply to the pump.

13 Re-Calibrating the Pressure Transducer and Verifying the Pressures (Pumps Installed With 630140 or 654140 PCB Assemblies)

Note: *This procedure is only applicable for pumps installed with the 630140 or 654140 PCB assemblies and is conducted in two stages. The first stage is to set up air pressure in the pressure source pump. The pressure source pump is then used to provide the air pressure to re-calibrate the affected field pump.*

Note: *This procedure can only be carried out on pumps which have software version **V5.31** or higher (Refer to Page 62, Checking the Software Version of the Pump, below).*

Note: *Connect the flow/pressure rig (Table 6, Item 40) to the alternating feed **A** on each of the 3-way pump tubeset adaptors (Table 6, Item 50) using tubing (Table 6, Item 80) and 'T' piece (Table 6, Item 70) as show in Figure 37. Do **NOT** connect the 3-way pump tubeset adaptors to the pressure source or the affected field pumps until instructed to do so.*

Setting up the Pressure Source Pump

13.1 Connect the pressure source pump to a PC using the Serial Communications Pack. Refer to Page 46, Section 5.

13.2 Run the Communicator software on the PC (Refer to Page 49, Section 6).

13.3 Make sure that the top right of the dialog box shows the **File Version: SERS001-XX**, where "**XX**" is the version number, and must be "**02**" or higher.

13.4 Make sure **Auto Logic** is selected on the **Connection** drop-down menu, and the **Auto Logic Commands** menu is displayed.

13.5 Make sure the screen is maximised, so that the **Tx Rx** box can be viewed (Refer to Figure 30).

13.6 Connect the mains/power supply to the pressure source pump as follows:

13.6.1 Plug in and switch on the mains/power supply to the pressure source pump.

13.6.2 The power-up BIST routine will run for approximately 20 seconds (Refer to Page 42, Section 3).

Note: *Do NOT press the **Run/Standby** button on the control panel during the power-up BIST routine.*

13.7 On the Communicator software, scroll through the menu of **Auto Logic Commands** to the section heading **RE-CALIBRATE_TRANSDUCER** (Refer to Page 54, Section 7).

Note: *Use the commands that are in this section but if necessary overwrite the parameters as directed below.*

Note: *The commands in **RE-CALIBRATE_TRANSDUCER** section are in a different order to that in the following recalibration procedure.*

Setting the Air Pressure on the Pressure Source Pump

13.8 Send the command **703 - Enable_Test_Mode**, to put the pump into test mode.

13.9 Send the command **707 - Initialise_Stepper_Position**. Listen to the movement of the stepper motor in the pump manifold assembly, and wait for it to stop turning before you attempt to send the next command to the pump.

13.10 Select **707 - Set_Stepper_Position_b** but do not send. In the parameter box, overwrite the value with the letter **m**. Send the command **707**. Wait for it to stop turning before you attempt to send the next command to the pump (about two seconds).

13.11 Connect the 3-way pump tubeset adaptor to the pressure source pump (refer to Figure 37). Connect the flow/pressure rig to the alternating feed **A** on the 3-way pump tubeset adaptor.

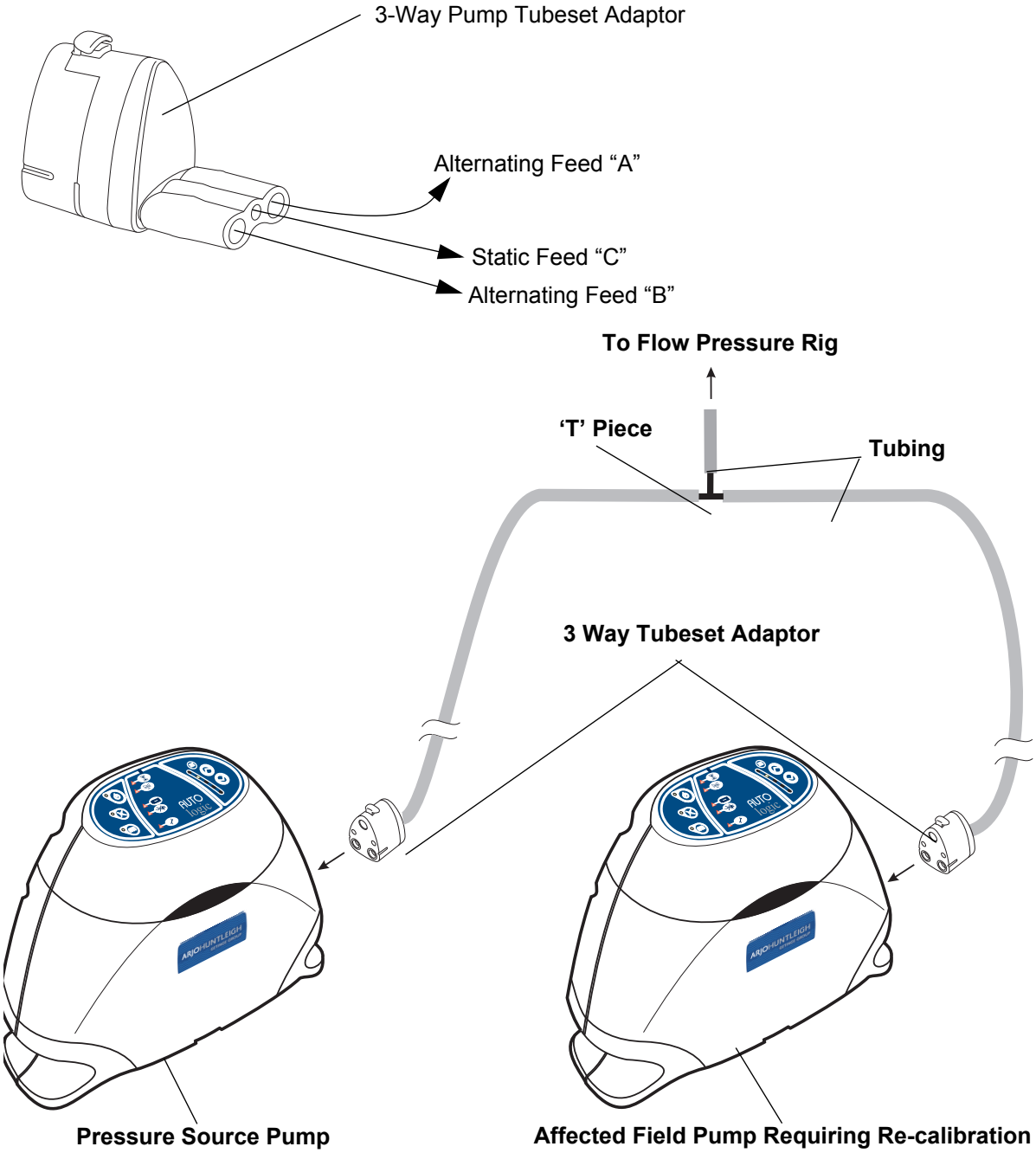


Figure 37 - Pressure Source Pump and Affected Field Pump Set Up

13.12 Select **705 - Set_Compressor_1455** but do not send. In the parameter box, overwrite the values as follows:

- Level = **18**
- Frequency = **54**.

Send the command **705**.

13.13 Fully close the valve on the flow/pressure rig.

13.14 Wait five seconds.

13.15 The read command **70A - Read_Pressure** and check that the pressure gauge reading is between **110 and 130 mmHg**:

13.15.1 If the pressure gauge reading is between **110 and 130 mmHg**, then continue the test at Para 13.16.

13.15.2 If the pressure gauge reading is ***NOT*** between **110 and 130 mmHg**, then do the following:

13.15.2.1 Select the command **705 - Set_Compressor_1455**, but do not send it to the pump.

13.15.2.2 In the parameter box, overwrite the **Level** parameter of command **705 - Set_Compressor_1455**, as follows:

- If the pressure is greater than **130 mmHg**, reduce the **Level** parameter value by one.
- If the pressure is less than **110 mmHg**, increase the **Level** parameter value by one.

13.15.2.3 Send the command **705 - Set_Compressor_1455** to the pump.

13.15.2.4 Repeat Para 13.14 to Para 13.15 until the pressure gauge reading is between **110 and 130 mmHg**.

13.16 The pressure source pump is now configured to provide air pressure to re-calibrate the affected field pump.

Re-calibrating the Field Service Pump with 630140 or 654140 PCB Assemblies

Note: *The pressure source pump must remain running throughout the test.*

13.17 Carefully remove the Serial Communications Pack from the pressure source pump whilst the pump is still running and attach it to the affected field pump requiring re-calibration.

13.18 Make sure the **Auto Logic Commands** menu is still displayed on the Communicator software on the PC.

13.19 Make sure the screen is still maximised, so that the **Tx Rx** box can be viewed.

13.20 Connect the mains/power supply to the affected field pump as follows:

13.20.1 Plug in and switch on the mains/power supply to the affected field pump.

13.20.2 The power-up BIST routine will run for approximately 20 seconds (Refer to Page 42, Section 3).

Note: *Do NOT press the **Run/Standby** button on the control panel during the power-up BIST routine.*

13.21 On the Communicator software, scroll through the menu of **Auto Logic Commands** to the section heading **RE-CALIBRATE_TRANSDUCER** (Refer to Page 54, Section 7).

Note: *Use the commands that are in this section but if necessary overwrite the parameters as directed below.*

Note: *The commands in **RE-CALIBRATE_TRANSDUCER** section are in a different order to that in the following recalibration procedure.*

13.22 Send the command **703 - Enable_Test_Mode**, to put the pump into test mode.

13.23 Send the command **707 - Initialise_Stepper_Position**. Listen to the movement of the stepper motor in the pump manifold assembly, and wait for it to stop turning before you attempt to send the next command to the pump.

13.24 Select **707 - Set_Stepper_Position_b** but do not send. In the parameter box, overwrite the value with the letter **m**. Send the command **707 - Set_Stepper_Position_b**. Wait for it to stop turning before you attempt to send the next command to the pump (about two seconds).

13.25 Send the command **70E - Calibrate**. This will erase the previous calibration.

13.26 Send the command **70F - Auto_Balance** to set the stepper motor in the pump manifold assembly (Auto Balance) to zero.

13.27 Wait until **WAITING** is displayed in the **Tx Rx** box.

13.28 Connect the 3-way pump tubeset adaptor to the affected field pump (refer to Figure 37).

13.29 Wait five seconds. This allows the air pressure in the tubes to stabilise.

13.30 Execute command **710 - Auto_Gain** as follows:

13.30.1 Select the command **710 - Auto_Gain**, but do not send it to the pump.

13.30.2 In the **Applied_Pressure** parameter box, overwrite the value with the actual pressure gauge reading from the flow pressure rig.

13.30.3 Send the command **710 - Auto_Gain** to the pump.

13.31 Wait until **WAITING** is displayed in the **Tx Rx** box.

13.32 Send the command **711 - Calibration_End**. The pump will end the calibration and display the zero, gain and calibration adjust values.

13.33 Wait five seconds.

13.34 Send the command **70A - Read_Pressure**.

13.35 Compare the value of the pressure received from the pump in the **Receive** part of the dialog box on the PC against the value of the pressure shown on the pressure/flow rig.

13.35.1 If the two values are within **±5 mmHg** of each other, then continue the test at Para 13.40.

13.35.2 If the two values are ***NOT*** within **±5 mmHg** of each other, then continue the test at Para 13.36 to make a fine adjustment to the transducer calibration.

Making Fine Adjustments to the Transducer Calibration

13.36 Select the command **766 - Eng_Fine_Adjust,** but do not send it to the pump.

13.37 In the **Enter_Actual_Pressure** parameter box, enter the value of the pressure shown on the pressure flow rig.

13.38 Send the command **766 - Eng_Fine_Adjust,** to the pump.

13.39 Wait five seconds before repeating Para 13.34.

End of Test

13.40 Send the command **704 - Disable_Test_Mode**.

13.41 Select the command **705 - Stop_Compressor,** but do not send it to the pump. In the parameter box, overwrite the values as follows:

- Level = **14**
- Frequency = **0**.

Send the command **705 - Stop_Compressor**.

13.42 Switch off the mains/power supply to both pumps.

13.43 Remove 3-way pump tubeset adaptors from both pumps.

13.44 Disconnect from the mains.

13.45 Replace serial port covers on both pumps.

14 Setting the Service Hours on the Pump

During every pump service, the Service Hours counter on the pump must be set to 17520 hours (which equals two years). The Service Hours counter counts *down* while the pump is operating. When the Service Hours counter reaches zero, the yellow **Service** indicator on the pump control panel will illuminate and remain on to indicate that the pump is ready for a service.

14.1 If you are operating the pump from a PC via the IR Interface Module, do **NOT** switch on the mains/power supply to the pump until instructed to do so.

14.2 Connect the pump to a PC using either the Serial Communications Pack or the IR Interface Module (Refer to Page 46, Section 5).

14.3 Run the Communicator software on the PC (Refer to Page 49, Section 6).

14.4 Make sure that the top right of the dialog box shows the **File Version: SERS001-XX**, where "**XX**" is the version number, and must be "**02**" higher.

14.5 Make sure **Auto Logic** is selected on the **Connection** drop-down menu, and the **Auto Logic Commands** menu is displayed.

14.6 Make sure the screen is maximised, so that the **Tx Rx** box can be viewed (Refer to Figure 30).

14.7 To connect the mains/power supply to the pump, do the following:

14.7.1 If the Serial Communications Pack is being used:

14.7.1.1 Plug in and switch on the mains/power supply to the pump.

14.7.1.2 The power-up BIST routine will run for approximately 20 seconds (Refer to Page 42, Section 3).

Note: *Do NOT press the **Run/Standby** button on the control panel during the power-up BIST routine.*

14.7.2 If the IR Interface Module is being used, carry out the procedure to connect the pump to the PC via the IR Interface Module (Refer to Page 56, Section 8).

14.8 On the Communicator software, scroll through the menu of **Auto Logic Commands** to the section heading **SERVICE** (Refer to Page 54, Section 7).

14.9 Send the command **202 - Set_Service_Hours_17520**.

Note: *The value of the **Hours** parameter should already be set to **17520**.*

14.10 Send the command **206 - Read Run Hours**. Check the response from the pump, displayed in the **Receive** part of the dialog box, is **206 = 0 hours**.

Note: *Command **206 - Read Run Hours** will respond with the number of hours that the pump has been running since the service hours have been reset using the command **202 - Set Service Hours**.*

*The command **201 - Read Service Hours** will always respond with the original number that the service hours was set to using the **202 - Set Service Hours** command, e.g. 17520.*

14.11 Switch off the mains/power supply to the pump.

15 Checking the Sounder and Power Fail Alarm LED Indicators

The procedure applies to all pumps:

15.1 Turn on the pump and allow the BIST to run, and for the ‘WAIT’ LED to extinguish.

15.2 Press the Run/Standby button to start operation of the pump.

15.3 Wait 20 seconds, and then turn off the mains supply to the pump.

15.4 After approximately four seconds the alarm will sound and the ‘POWER FAIL’ LED will flash. The red LED on the front of the pump will also be flashing.

15.5 To stop the alarm, turn on the mains supply.

15.6 Once again the BIST will run. When complete, the pump will attempt to restart operation. Press and hold the Run/Standby button to stop pump operation.

16 Setting Up a New Control PCB Assembly

16.1 If you are operating the pump from a PC via the IR Interface Module, do **NOT** switch on the mains/power supply to the pump until instructed to do so.

16.2 Connect the pump to a PC using either the Serial Communications Pack or the IR Interface Module (Refer to Page 46, Section 5).

16.3 Run the Communicator software on the PC (Refer to Page 49, Section 6).

16.4 Make sure that the top right of the dialog box shows the **File Version: SERS001-XX**, where “**XX**” is the version number, and must be “**02**” or higher.

16.5 Make sure **Auto Logic** is selected on the **Connection** drop-down menu, and the **Auto Logic Commands** menu is displayed.

16.6 Make sure the screen is maximised, so that the **Tx Rx** box can be viewed (Refer to Figure 30).

16.7 To connect the mains/power supply to the pump, do the following:

16.7.1 If the Serial Communications Pack is being used:

16.7.1.1 Plug in and switch on the mains/power supply to the pump.

16.7.1.2 The power-up BIST routine will run for approximately 20 seconds (Refer to Page 42, Section 3).

Note: *Do NOT press the **Run/Standby** button on the control panel during the power-up BIST routine.*

16.7.2 If the IR Interface Module is being used, carry out the procedure to connect the pump to the PC via the IR Interface Module (Refer to Page 56, Section 8).

16.8 On the Communicator software, scroll through the menu of **Auto Logic Commands** to the section heading **CONTROL_PCB_SETUP** (Refer to Page 54, Section 7).

Note: *For all of the commands in this section, retain the default values in the parameter boxes, unless instructed to do otherwise.*

16.9 Send the command **703 - Enable_Test_Mode**.

16.10 Send the command **304 - Set_GMT_Date**.

16.11 Send the command **202 - Set_Service_Hours_17520**.

16.12 Send the command **208 - Reset_SST_Errors**.

16.13 Send the command **726 - Eng_Comp_Freq**.

16.14 Send the command **715 - Set_Seatpad_LP_Threshold**.

16.15 Send the command **409 - Mute_Alarm**.

16.16 Send the command **407 - Load_Customer_Name**.

Note: *Before sending the command to the pump, either type in a new Customer Name or delete the old name and leave the parameter box empty.*

16.17 Send the command **A11 - Log_Clear_All**.

Note: *This will clear both the **Critical** and **Non Critical Event Logs** on the pump.*

16.18 Send the command **704 - Disable_Test_Mode**.

16.19 Switch off the mains/power supply to the pump.

17 Setting the GMT Time and Date

17.1 If you are operating the pump from a PC via the IR Interface Module, do **NOT** switch on the mains/power supply to the pump until instructed to do so.

17.2 Connect the pump to a PC using either the Serial Communications Pack or the IR Interface Module (Refer to Page 46, Section 5).

17.3 Run the Communicator software on the PC (Refer to Page 49, Section 6).

17.4 Make sure that the top right of the dialog box shows the **File Version: SERS001-XX**, where "**XX**" is the version number, and must be "**02**" higher.

17.5 Make sure **Auto Logic** is selected on the **Connection** drop-down menu, and the **Auto Logic Commands** menu is displayed.

17.6 Make sure the screen is maximised, so that the **Tx Rx** box can be viewed (Refer to Figure 30).

17.7 To connect the mains/power supply to the pump, do the following:

17.7.1 If the Serial Communications Pack is being used:

17.7.1.1 Plug in and switch on the mains/power supply to the pump.

17.7.1.2 The power-up BIST routine will run for approximately 20 seconds (Refer to Page 42, Section 3).

Note: *Do NOT press the **Run/Standby** button on the control panel during the power-up BIST routine.*

17.7.2 If the IR Interface Module is being used, carry out the procedure to connect the pump to the PC via the IR Interface Module (Refer to Page 56, Section 8).

17.8 On the Communicator software, scroll through the menu of **Auto Logic Commands** to the section heading **MANUFACTURE** (Refer to Page 54, Section 7).

17.9 Send the command **304 - Set_GMT_Date**.

Note: *The values of the **Time** and **Date** parameters should already be set to the correct default values.*

17.10 Send the command **310 - Read_GMT_Date_and_Time**. Check that the date and time have been set correctly.

17.11 Switch off the mains/power supply to the pump.

18 Pressure Logging using the Communicator Software (if applicable)

This feature is not available with all software versions. If available, it allows the service engineer to view real-time pressures on the three outlet ports of the pump using the Communicator software.

Note: *This is only a graphical representation of the pressures, and all pressure values are approximate. The graph should therefore be used for indication only.*

18.1 If you are operating the pump from a PC via the IR Interface Module, do **NOT** switch on the mains/power supply to the pump until instructed to do so.

18.2 Connect the pump to a mattress replacement, mattress overlay or seat cushion.

18.3 Connect the pump to a PC using either the Serial Communications Pack or the IR Interface Module (Refer to Page 46, Section 5).

18.4 Run the Communicator software on the PC (Refer to Page 49, Section 6).

18.5 Make sure that the top right of the dialog box shows the **File Version: SERS001-XX**, where "**XX**" is the version number, and must be "**02**" higher.

18.6 Make sure **Auto Logic** is selected on the **Connection** drop-down menu, and the **Auto Logic Commands** menu is displayed.

18.7 Make sure the screen is maximised, so that the **Tx Rx** box can be viewed (Refer to Figure 30).

18.8 To connect the mains/power supply to the pump, do the following:

18.8.1 If the Serial Communications Pack is being used:

18.8.1.1 Plug in and switch on the mains/power supply to the pump.

18.8.1.2 The power-up BIST routine will run for approximately 20 seconds (Refer to Page 42, Section 3).

Note: *Do NOT press the **Run/Standby** button on the control panel during the power-up BIST routine.*

18.8.2 If the IR Interface Module is being used, carry out the procedure to connect the pump to the PC via the IR Interface Module (Refer to Page 56, Section 8).

18.9 On the Communicator software, scroll through the menu of **Auto Logic Commands** to the section heading **ENGINEERING** (Refer to Page 54, Section 7).

18.10 Send the command **724 - Enable_Pressure_Logging**, to start the logging function.

18.11 Click the **Logger** tab on the Communicator software.

18.12 Press the **Run/Standby** button on the top of the pump, to put the pump into **Run** mode.

18.13 The **Logger** screen will display real-time pressures on the three outlet ports of the pump (Refer to Figure 38).

18.14 To stop the logging function, do the following:

18.14.1 Press the **Run/Standby** button for two seconds to put the pump into **Standby**.

18.14.2 Click the **Command List** tab on the Communicator software.

18.14.3 On the Communicator software, scroll through the menu of **Auto Logic Commands** to the section heading **ENGINEERING**.

18.14.4 Send the command **725 - Disable_Pressure_Logging**, to stop the logging function.

18.15 Switch off the mains/power supply to the pump.

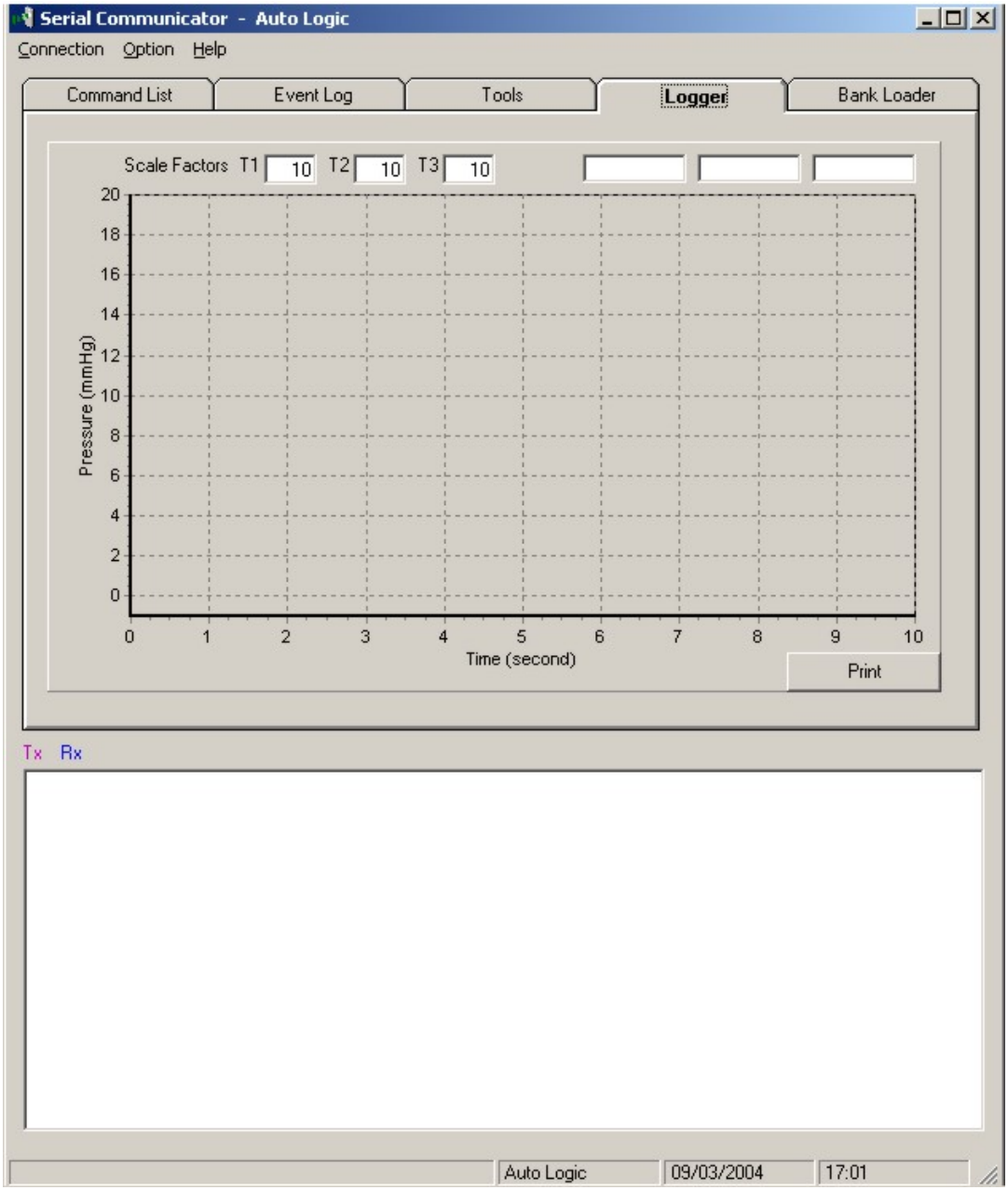


Figure 38 - Communicator Software - Logger Screen

19 Electrical Safety Testing

To test and calibrate the pump unit correctly, the test equipment in Table 7 is required.

Table 7 - Electrical Test Equipment

Item	Test Equipment
1	Insulation Resistance Tester (Megger), 500 Vdc
2	Portable Appliance Tester
3	Dielectric Strength Tester (Flash Tester), 4.0 kVac with current limit

Electrical Safety Checks - Class II (Double Insulated)

The following electrical safety checks must be carried out after breakdown repairs and servicing. Where alternatives are given, the test will depend upon the available test equipment.

- Insulation Resistance Test (Megger Test)
- Dielectric Strength (Flash Test)

Insulation Resistance Test

This test checks the integrity of the appliance's insulation. This test is applied between the live and neutral wires (connected together) and the appliance's enclosure.

Test Procedure

- 500 Vdc is applied to the insulation and the measured resistance must be greater than 2MΩ.

Note: *This test can be conducted using a Portable Appliance Tester.*

Dielectric Strength Test (Flash Test)

This test shows the response of the insulation to high a.c. voltage stress, indicates the effects of capacitive current, and gives an early warning of insulation problems which may develop in the appliance.

Leakage Circuit Test (USA)

This test measures the risk currents in accordance with the ANSI-AAMI ESI-1993 Standard (American National Standard Safe Current Limits for Electromedical Apparatus) or as specified in UL 60601-1).

WARNING: DANGER OF ELECTRIC SHOCK. DO NOT TOUCH ANY EXPOSED PARTS WHILE CONDUCTING THIS TEST. DO NOT TOUCH ANY PART OF YOUR BODY WITH THE CONTACTS OF THE PROBES.

WARNING: THIS EQUIPMENT SHOULD NOT BE USED IF YOU HAVE A HEARING AID OR PACEMAKER FITTED, DUE TO THE POSSIBILITY OF ELECTROMAGNETIC DISTURBANCE.

CAUTION: The voltage levels used for this test, may stress and weaken the insulation. This test is therefore not recommended as a routine test. It should be only used after a major assembly/disassembly has been completed.

Test Procedure

- 4 kVac is applied between the live and neutral wires (connected together) and the appliance's non-earthed enclosure. No breakdown should occur.

20 Inflation Test of the Mattress Replacement, Overlay or Seat Cushion

This procedure must be carried out after a service or major repair of the mattress replacement, mattress overlay or seat cushion.

To test the mattress replacement, mattress overlay or seat cushion correctly, the test equipment in Table 8 is required.

Table 8 - Mattress Replacement, Overlay and Seat Cushion Inflation Test Equipment

Item	Test Equipment
1	Flow / Pressure Rig, 3-26 ltr/min
2	Portable Inflation Test Unit
3	Stopwatch

Test Procedure

20.1 Connect a portable inflation test unit to the mattress replacement, mattress overlay or seat cushion.

20.2 Fully inflate one bank of cells on the mattress replacement, mattress overlay or seat cushion, and connect them to a pressure/flow meter.

20.3 Test the bank of cells to the requirements detailed in Table 9.

Table 9 - Inflation Test Requirements

Parameter	Value
Inflation test pressure:	35 - 40 mmHg
Inflation stabilisation period:	30 seconds
Inflation test period:	3 minutes
Leak rate:	Must not exceed 3 mmHg

20.4 Repeat Para 20.2 and 20.3 for the remaining bank(s) of cells on the mattress replacement, mattress overlay or seat cushion.

20.5 If the mattress replacement, mattress overlay or seat cushion fails any of the tests, do the following:

20.5.1 Investigate as to the reason why.

20.5.2 Repair any faults in accordance with the following:

- Mattress Replacement: Refer to Chapter 6 “Mattress Repair” and Chapter 6, Page 144, Section 22.
- Mattress Overlay: Refer to Chapter 6 “Mattress Repair”.
- Seat Cushion: Refer to Chapter 7 “Seat Cushion Repair”.

20.5.3 Repeat the above test procedure to re-test the mattress replacement, mattress overlay or seat cushion after the repair (Refer to Page 75, Section 20).

21 Pneumatic Test For Cell in Cell Static Line

21.1 Remove the mattress top cover.

21.2 Open the test port located at CPR end.

21.3 Connect the flow/pressure rig to Test Port and ensure the CPR is fully closed.

21.4 Inflate the mattress with the pump.

21.5 When pressure has stabilised, disconnect the pump from the mattress.

21.6 The Manometer reading should not drop more than **1 mmHg in 1 minute**.

Note: *If the mattress fails test, check all connections and fittings for leaks and visually inspect the mattress for cuts or damage. Retest accordingly.*

21.7 Remove the flow/pressure rig from the Test Port and close the Test Port (refer to Chapter 1 “Introduction”, Page 1, Section 10).

21.8 Activate CPR to deflate the mattress.

21.9 Replace the mattress top cover.

CHAPTER 5

PUMP REPAIR

1 General

This chapter details repair procedures for the **Auto Logic** pump. All repairs should be carried out by ArjoHuntleigh approved service personnel.

In 2010 the casing of the Auto Logic pump was updated. The updated pump casings are **NOT** compatible with the old pump cases. For a list of identifying changes refer to Page 4, "Auto Logic Front and Rear Case Changes 2010". Various illustrations throughout this section will show detail of the old pump casing, however where procedures/part numbers are affected, these are detailed as required.

2 Pump Repair to Testing Requirements

Table 10 defines the test requirements which must be carried out on the pump following certain repairs:

Note: *You must carry out the Basic System Operation after **ALL** repairs (Refer to Chapter 4 "Testing", Page 42, Section 3.*

2.1 To Check the Pump Pressures and Flows, refer to:

- Chapter 4 "Testing", Page 58, Section 10 if a PC and Communicator software is used.
- Chapter 4 "Testing", Page 42, Section 4 if a PC and Communicator software is ***NOT*** used.

2.2 To Check the Transducer Calibration, refer to Chapter 4 "Testing", Page 60, Section 11.

2.3 To Set the Service Hours, refer to Chapter 4 "Testing", Page 69, Section 14.

2.4 To Set Up the Control PCB Assembly, refer to Chapter 4 "Testing", Page 70, Section 16.

2.5 To Set the Time and Date, refer to Chapter 4 "Testing", Page 71, Section 17.

2.6 To carry out the Electrical Safety Tests, refer to Chapter 4 "Testing", Page 74, Section 19.

Table 10 - Repair to Testing Requirements

Components / Assemblies	Check Pressures and Flows	Check Transducer Calibration	Set Service Hours	Control PCB Setup	Set Time/ Date	Electrical Safety Tests
Compressor Assembly	Yes	Yes	Yes	No	No	Yes
Manifold Assembly	Yes	Yes	Yes	No	No	Yes
Control PCB Assembly	Yes	Yes	Yes	Yes	Yes	Yes
Power Supply PCB Assy	Yes	Yes	No	No	No	Yes
Membrane Label	No	No	No	No	No	Yes
Front Case	Yes	No	No	No	No	Yes
Rear Case	No	No	No	No	No	Yes
Silencer Bag & Tubes	No	No	No	No	No	No
Air Filters	No	No	No	No	No	No
Hooks	No	No	No	No	No	No
Battery on Control PCB	No	No	No	No	Yes	Yes
Power Supply PCB Fuses	No	No	No	No	No	Yes
Mains/Power Cordset	No	No	No	No	No	Yes

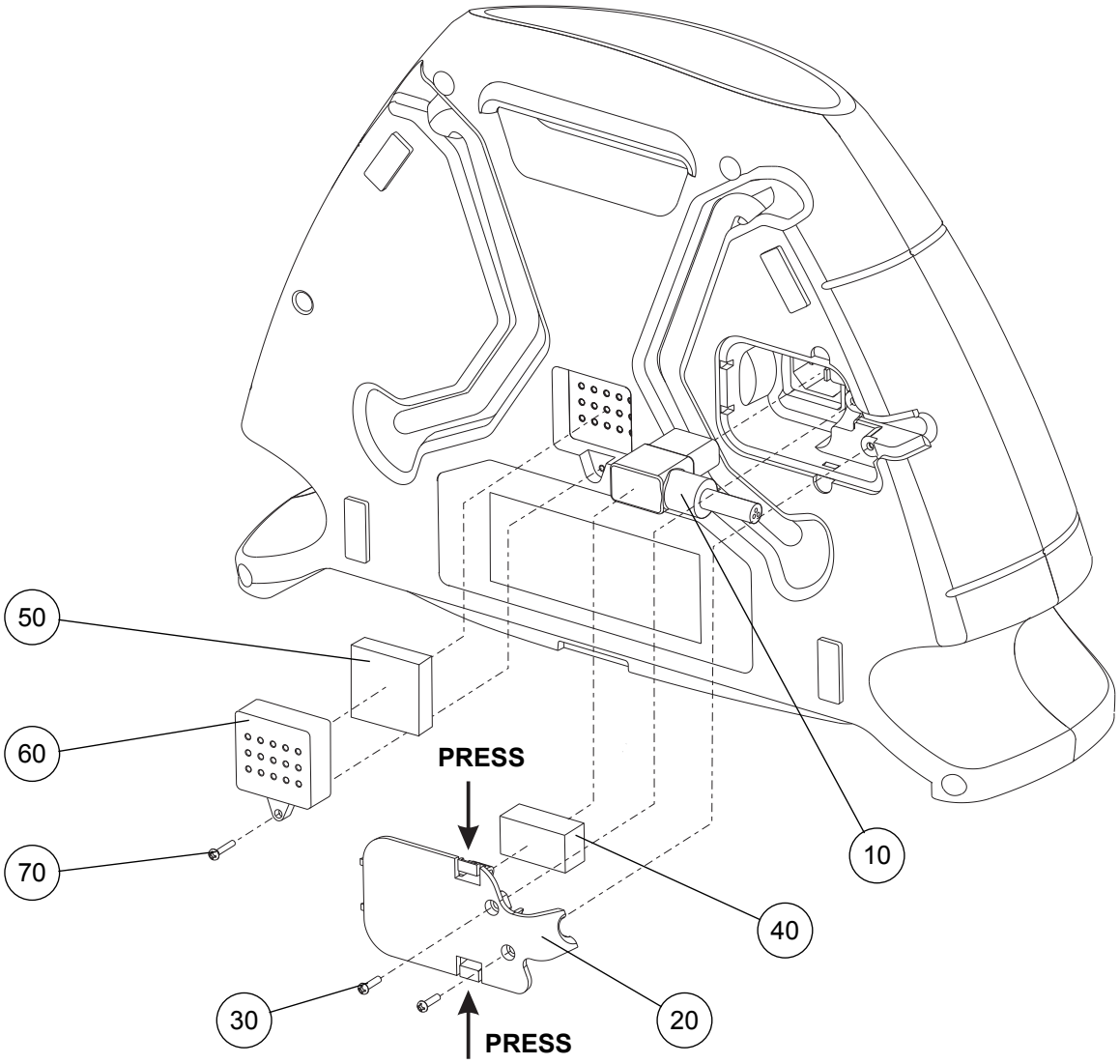


Figure 39 - Replacing the Mains/Power Cordset and Air Inlet Filter

Table 11 - Mains/Power Cordset and Air Inlet Filter Parts List

Item	Part Number	Description	Qty
10	Refer to Page 122, Table 33	Mains/Power Cordset, 6m Coiled	1
20	630329	IEC Connector Cover	1
30	FAS223	Screw, 3 dia x 10 Pan Head	2
40	630499	Pad	1
50	507374	Air Inlet Filter Felt	1
60	630326	Filter Cover	1
70	FAS145	Screw, 3 dia x 8 Pan Head	1

3 Removing the Mains/Power Cordset

WARNING: BEFORE REPLACING THE MAINS/POWER CORDEST, MAKE SURE THE PUMP UNIT HAS BEEN ISOLATED FROM THE MAINS/POWER SUPPLY BY REMOVING THE MAINS/POWER PLUG FROM THE WALL SOCKET.

Note: *The pump has a fail-safe design, which means that if the rear case is removed with the mains/ power cordset still connected to the pump, the mains/power cordset connector is automatically removed with the rear case, and so the mains/power is immediately disconnected from the pump.*

3.1 Lay the pump face down on a flat surface.

3.2 Remove the two screws (Fig 39, Item 30) from the IEC connector cover (Fig 39, Item 20) on the rear case.

3.3 Press the two retaining clips together on the top and bottom of the IEC connector cover to release it from the rear case (Refer to Figure 39), and lift the IEC connector cover out of the rear case.

3.4 Pull the IEC cordset connector (Fig 39, Item 10) out of the IEC connector inside the pump.

4 Installing the Mains/Power Cordset

CAUTION: Make sure the replacement mains/power cordset (Fig 39, Item 10) is the correct type and rating, or the electrical safety of the pump may be impaired.

4.1 Carefully push the IEC cordset connector (Fig 39, Item 10) fully into the IEC connector inside the pump. Place the cable into the cutout in the side of the rear case.

4.2 Make sure the pad (Fig 39, Item 40) is stuck onto the inside of the IEC connector cover (Fig 39, Item 20).

4.3 Engage the two spigots on the left side of the IEC connector cover into the cutouts in the rear case. Make sure the cable is still in the cutout in the side of the rear case, and press the IEC connector cover down firmly until the two retaining clips on the top and bottom of the cover click into position in the rear case.

4.4 Install the two screws (Fig 39, Item 30) through the IEC connector cover into the rear case. Tighten the screws to secure the cable.

Note: *Do not over-tighten the screws, or you may strip the threads in the rear case.*

5 Removing the Air Inlet Filter

5.1 Lay the pump face down on a flat surface.

5.2 Remove the screw (Fig 39, Item 70), the filter cover (Fig 39, Item 60) and the air inlet filter felt (Fig 39, Item 50) out of the rear case.

6 Installing the Air Inlet Filter

6.1 Put the new air inlet filter felt (Fig 39, Item 50) into the back of the filter cover (Fig 39, Item 60).

6.2 Put the filter cover and air inlet filter felt into the slot in the rear case.

6.3 Install the screw (Fig 39, Item 70) to secure the filter cover.

Note: *Do not over-tighten the screw, or you may strip the thread in the rear case.*

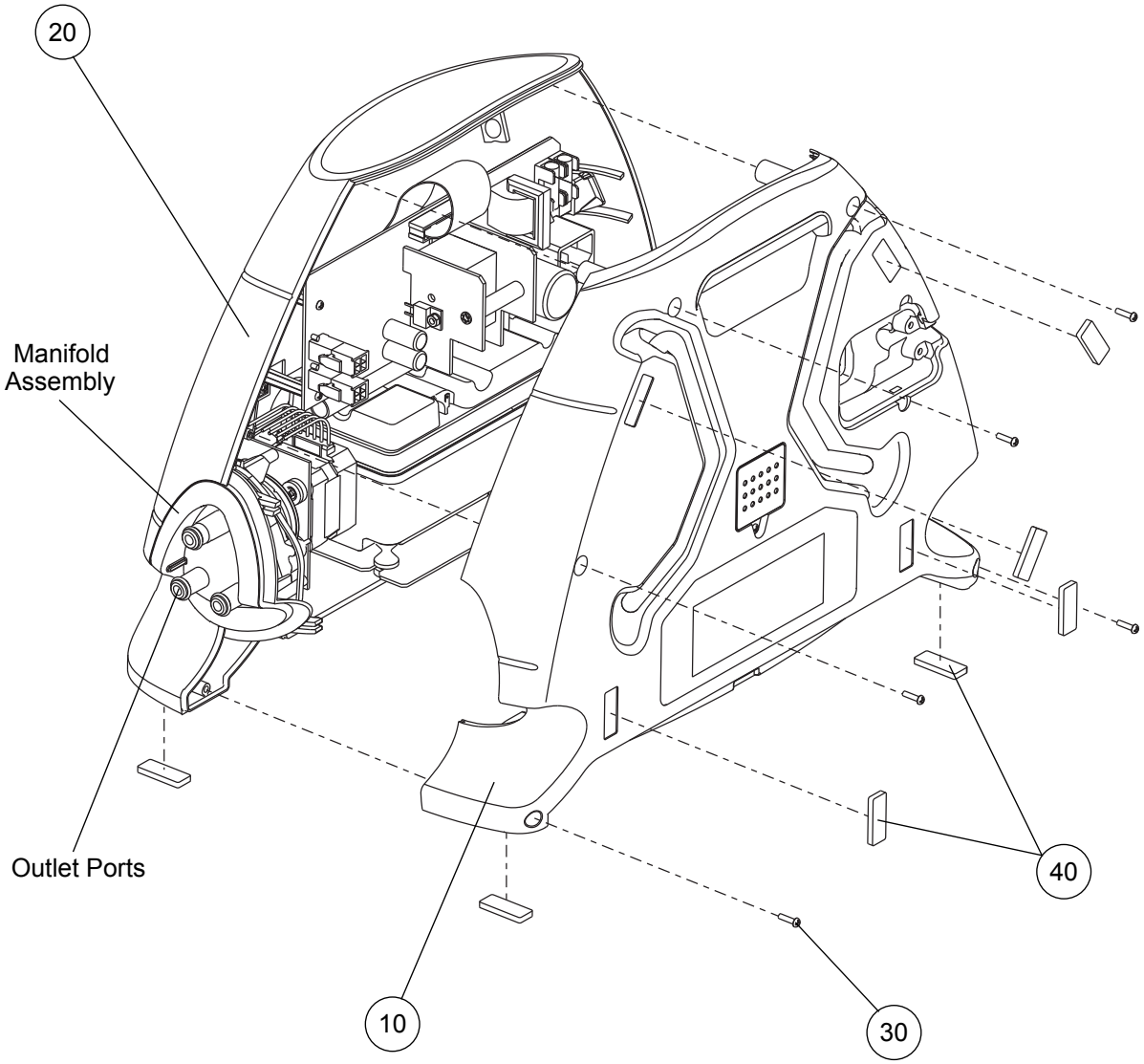


Figure 40 - Removing the Rear Case

Note: *The front and rear cases have been re-designed due to corporate re-branding and product re-tooling. This has resulted in the new style pump cases **NOT** being compatible with the old style pump cases. Therefore if either part is to be updated, both front and rear case parts must be replaced as a pair. The quickest way to identify the case type is to look for the connector for the optional patient handset which is only fitted to the old style front case.*

Table 12 - Front Case and Rear Case Parts List

Item	Part Number	Description	Qty
10	630321	Rear Case - Old style (Moulding only)	1
	630571	Rear Case - New style (Moulding only)	
20	630320	Front Case - Old style (Moulding only)	1
	630570	Front Case - New style (Moulding only)	
30	FAS225	Screw, 3 dia x 16 Pan Head	5
40	507413	Rubber Foot	8

7 Removing the Rear Case

7.1 Remove the mains/power cordset from the pump (Refer to Page 79, Section 3).

7.2 Lay the pump face down on a flat surface.

7.3 Remove the four screws (Fig 40, Item 30) and lift the rear case (Fig 40, Item 10) away from the front case (Fig 40, Item 20).

8 Installing the Rear Case

8.1 Lay the front case (Fig 40, Item 20) down with the inside surface pointing upwards.

8.2 Carefully lift the inner end of the manifold assembly, so that the outer face of the manifold assembly is flush with the side of the front case (Refer to Figure 40).

8.3 Hold the manifold assembly by the three outlet ports in that position, and install the rear case (Fig 40, Item 10) onto the front case (Refer to Figure 40).

Note: *The position of the manifold assembly may have to be adjusted slightly as the rear case is installed, so that the outer face of the manifold assembly remains flush with the sides of the front and rear cases.*

8.4 Install the four screws (Fig 40, Item 30) to secure the rear case to the front case.

8.5 Install the mains/power cordset to the pump (Refer to Page 79, Section 4).

Note: *Once stocks of the old style rear case have been exhausted, the new style rear case must be fitted. As the new rear case only fits the new front case, they must be replaced as a pair as described in Chapter 5 “Pump Repair”, Page 115, Section 36.*

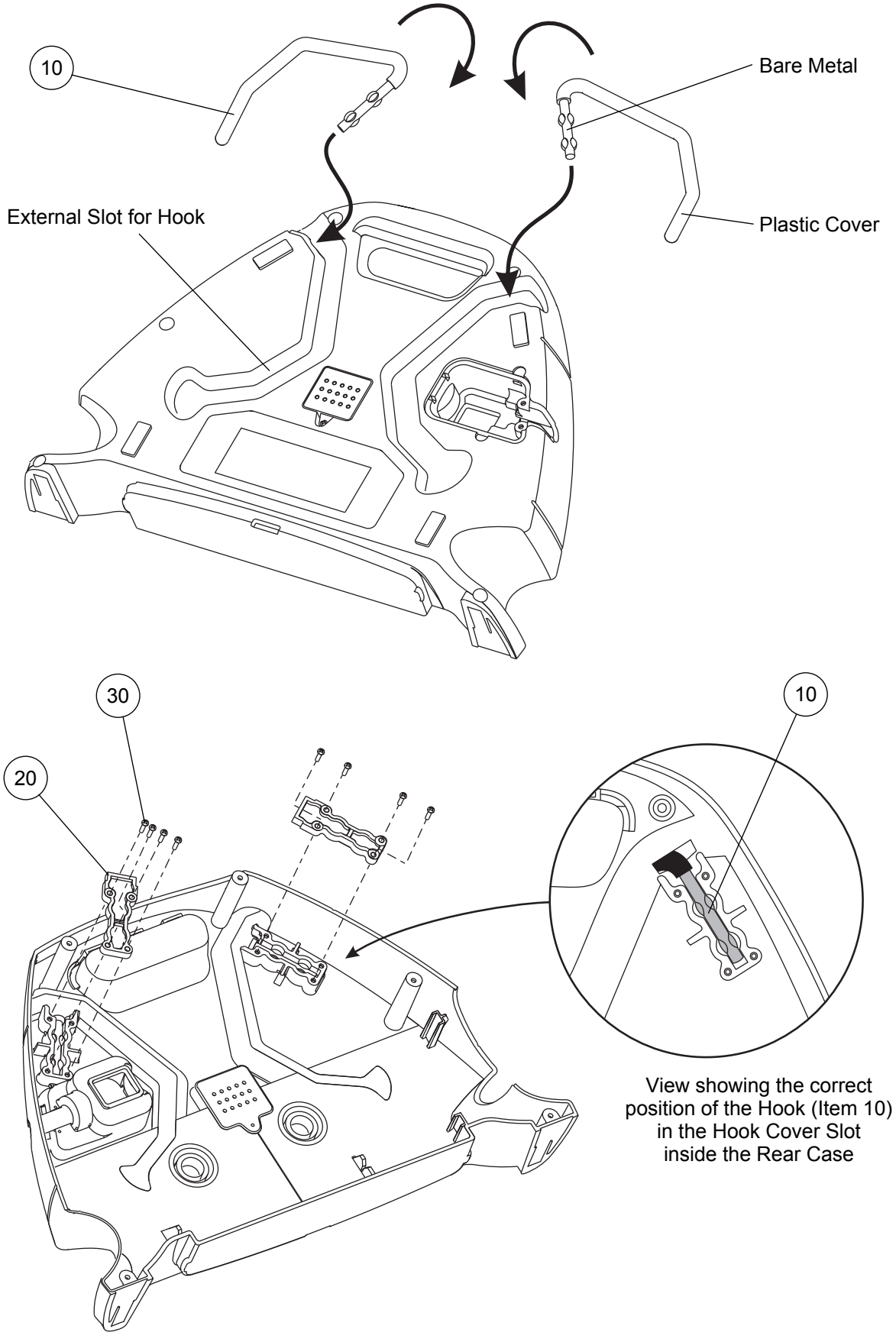


Figure 41 - Replacing the Hooks

9 Removing the Hooks

9.1 Remove the rear case from the front case (Refer to Page 80, Section Note:).

9.2 Lay the rear case down with the inside surface pointing upwards.

9.3 Remove the eight screws (Fig 41, Item 30) and two hook covers (Fig 41, Item 20) from the rear case.

9.4 Turn the rear case over so that the outside surface is pointing upwards, and remove the two hooks (Fig 41, Item 10) from the rear case.

Note: *It is easier to remove the hooks if they are first rotated so that they hang over the side of the rear case (Refer to Figure 41).*

10 Installing the Hooks

10.1 Lay the rear case down with the outside surface pointing upwards.

10.2 Put the two hooks (Fig 41, Item 10) in position, with the bare-metal end by the hole in the rear case and the plastic-covered end hanging over the side of the rear case (Refer to Figure 41).

10.3 Lift and rotate each hook, and carefully insert the bare-metal end of the hook through the hole in the rear case.

10.4 Rotate the hooks so that they lie flat in the external slots on the outside of the rear case.

Note: *If the hooks are not inserted far enough into the rear case, they will not lie flat in the slots.*

10.5 Hold the two hooks in their external slots, and turn the rear case over so that the inside surface is pointing upwards.

10.6 Make sure that the each hook is in the correct position in its hook cover slot inside the rear case (Refer to Figure 41).

10.7 Install the eight screws (Fig 41, Item 30) and two hook covers (Fig 41, Item 20) onto the rear case. Tighten the screws to secure the hooks.

Note: *Do not over-tighten the screws, or you may strip the threads in the rear case.*

10.8 Make sure the hooks:

- Rotate freely.
- Lie flat in the external slots on the rear case.

10.9 Install the rear case onto the front case (Refer to Page 81, Section 8).

Table 13 - Hook Parts List

Item	Part Number	Description	Qty
10	630315	Hook	2
20	630325	Hook Cover	2
30	FAS225	Screw, 3 dia x 16 Pan Head	8

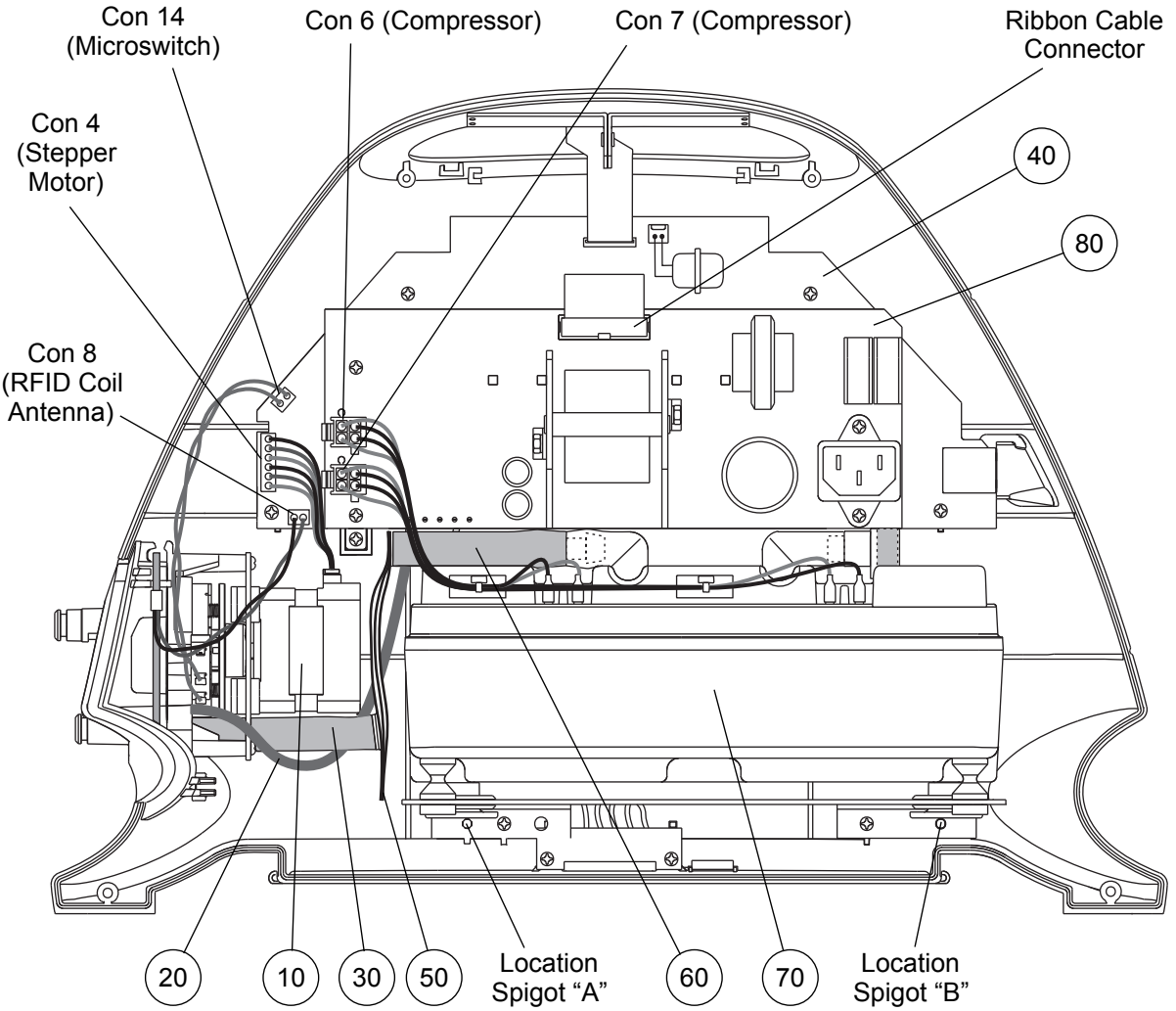


Figure 42 - Replacing the Manifold Assembly

Table 14 - Manifold Assembly Parts List

Item	Part Number	Description	Qty
10	630100	Manifold Assembly (including RFID Coil Antenna), Spares Item	1
20	REF	Tube, Manifold Assembly - Control PCB (Part of Item 40)	1
30	630349	Tube, Manifold Assembly - Silencer Bag Assembly	1
40	630400 630140 654140	Control PCB (superseded by 630140, from serial number 0900058473 onwards) Control PCB Control PCB (Autofirm model only)	1
50	630098	Silencer Bag Assembly	1
60	630334	Tube, Compressor Assembly - Silencer Bag Assembly	1
70	509051	Compressor Assembly, Series 6, 5.5V 50/60Hz	1
80	507058 507137	Power Supply PCB (superseded by 507137) Power Supply PCB (Printed Circuit Board) Assembly	1

11 Removing the Manifold Assembly

The manifold assembly spares item (Fig 42, Item 10) includes the RFID coil antenna.

11.1 Remove the rear case from the front case (Refer to Page 80, Section Note:).

11.2 Lay the front case down with the inside surface pointing upwards.

11.3 Disconnect the following cable connectors from the control PCB assembly (Fig 42, Item 40):

- To the manifold assembly, stepper motor (Fig 42, PCB Con 4).
- To the manifold assembly, RFID coil antenna (Fig 42, PCB Con 8).
- To the manifold assembly, microswitch (Fig 42, PCB Con 14).

11.4 Disconnect the following tubes from the back of the manifold assembly:

- The large diameter tube (Fig 42, Item 30) to the silencer bag assembly.
- The small diameter tube (Fig 42, Item 20) to the transducer on the control PCB assembly.

CAUTION: Do not disconnect the transducer tube from the transducer on the control PCB assembly. The transducer is a sensitive device and is easily damaged.

11.5 Lift the manifold assembly (Fig 42, Item 10) out of the front case.

12 Installing the Manifold Assembly

12.1 Lay the front case down with the inside surface pointing upwards.

12.2 Before installing the manifold assembly (Fig 42, Item 10), check the following parts are installed correctly on it (Refer to Figure 43):

12.2.1 The 6-way cable connector is pushed fully onto the stepper motor connector.

12.2.2 The connectors on the two red wires are pushed fully onto the microswitch terminals.

Note: *Make sure the red wire connectors are installed on the correct microswitch terminals - there is a third unused terminal on the microswitch. The two red wires are interchangeable.*

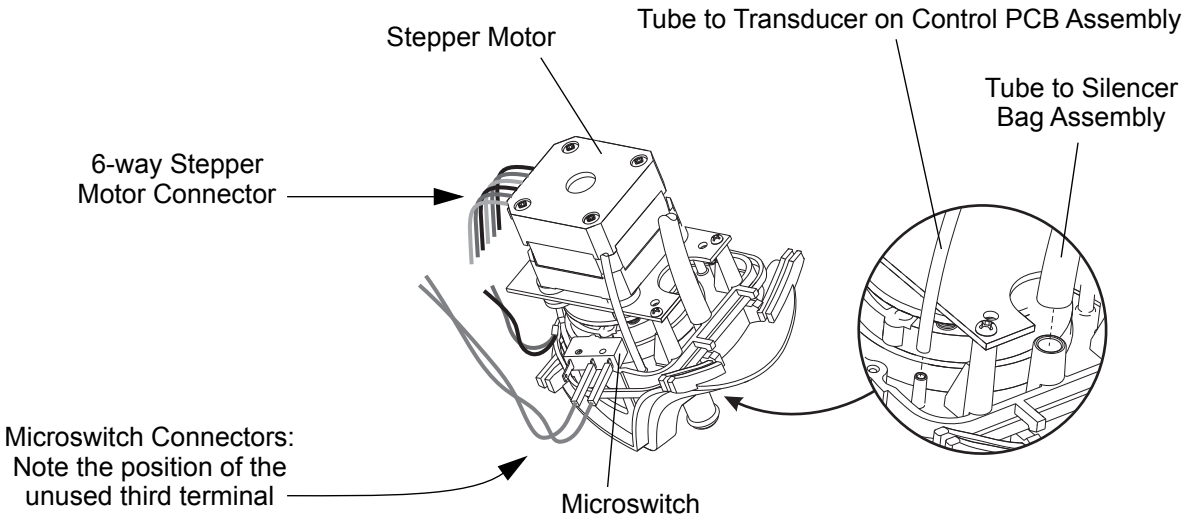

Stepper Motor
Tube to Transducer on Control PCB Assembly
Tube to Silencer Bag Assembly
6-way Stepper Motor Connector
Microswitch Connectors: Note the position of the unused third terminal
Microswitch

Figure 43 - Electrical and Pneumatic Connections to the Manifold Assembly

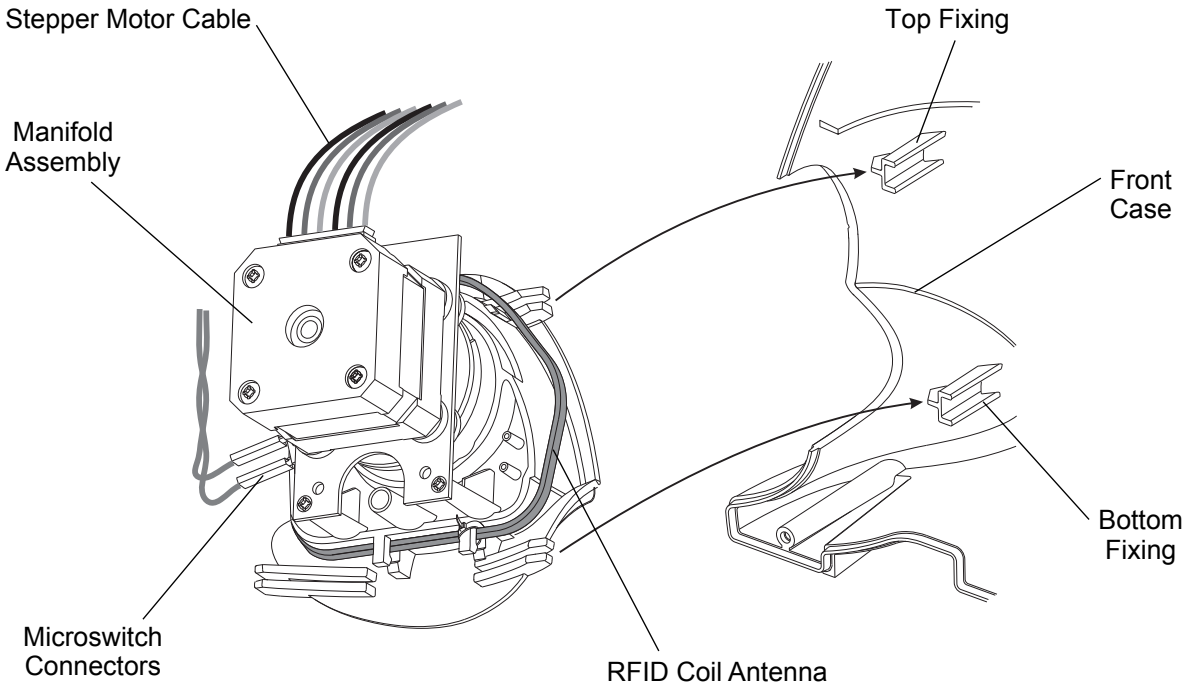


Figure 44 - Installing the Manifold Assembly

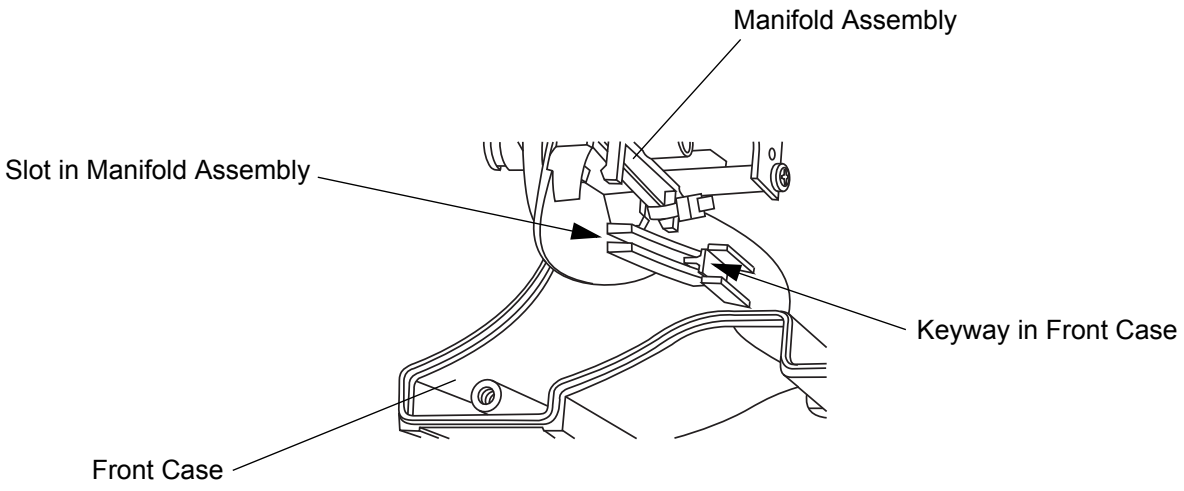


Figure 45 - Location of the Manifold Assembly in the Front Case

12.3 Install the manifold assembly into the cutout in the side of the front case. The manifold assembly is held in position by the top and bottom fixings (Refer to Figure 44).

Note: *For each fixing, put the keyway in the front case into the slot in the manifold assembly (Refer to Figure 45).*

Note: *Do not damage the antenna during the installation (Refer to Figure 44).*

12.4 Connect the following tubes onto the outlets on the back of the manifold assembly (Refer to Figure 43):

- Large diameter tube (Fig 42, Item 30) from the silencer bag assembly.
- Small diameter tube (Fig 42, Item 20) from the transducer on the control PCB assembly.

12.5 Make sure the small diameter transducer tube is pushed fully onto the top outlet on the transducer on the control PCB assembly (Refer to Figure 54).

CAUTION: Do not handle the transducer on the control PCB assembly unnecessarily. The transducer is a sensitive device. To avoid damage, put your finger at the back of the transducer while you push the transducer tube onto the top outlet at the front of the transducer.

12.6 Connect the following cable connectors onto the control PCB assembly (Fig 42, Item 40):

- From the manifold assembly, stepper motor (Fig 42, PCB Con 4).
- From the manifold assembly, RFID coil antenna (Fig 42, PCB Con 8).
- From the manifold assembly, microswitch (Fig 42, PCB Con 14).

12.7 Make sure the manifold assembly is still held in position by the top and bottom fixings (Refer to Figure 44), and install the rear case onto the front case (Refer to Page 81, Section 8).

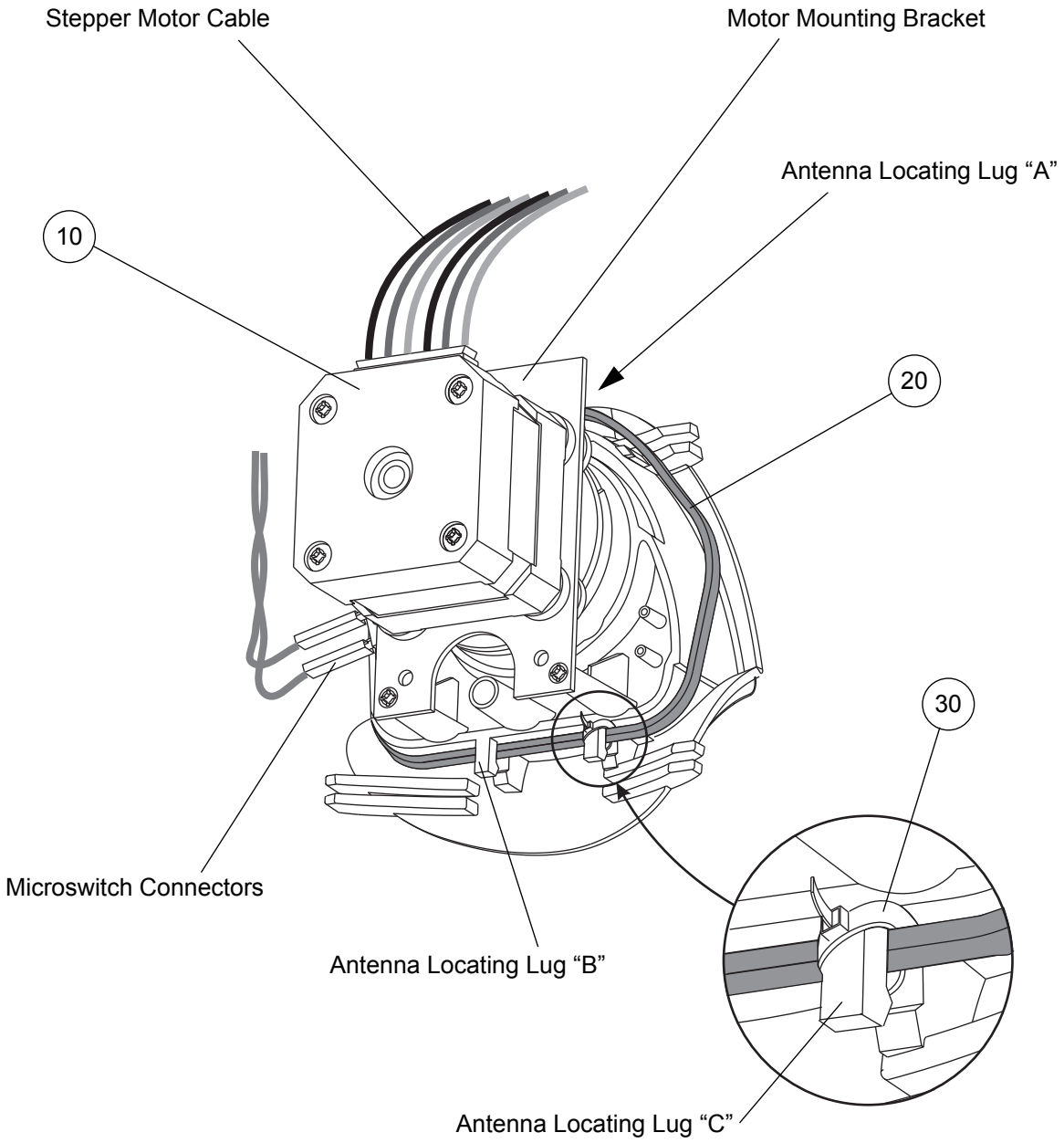


Figure 46 - Replacing the RFID Coil Antenna

Table 15 - RFID Coil Antenna Parts List

Item	Part Number	Description	Qty
10	630100	Manifold Assembly (including RFID Coil Antenna), Spares Item	1
20	630055	RFID Coil Antenna, Long	1
30	BP196	Cable Tie	1

13 Replacing the RFID (Radio Frequency Identification) Coil Antenna

CAUTION: Handle the RFID coil antenna with extreme care. The flying lead connection onto the RFID coil antenna is easily damaged.

13.1 Remove the manifold assembly from the pump (Refer to Page 85, Section 11).

13.2 Remove the two red wire connectors from the microswitch terminals on the manifold assembly (Refer to Figure 46).

13.3 Cut and remove the single cable tie (Fig 46, Item 30). This secures the RFID coil antenna (Fig 46, Item 20) to the antenna locating lug **C** (Refer to Figure 46).

Note: *Make sure you do not damage the antenna locating lug **C**.*

13.4 By carefully manoeuvring the RFID coil antenna, remove it from the three antenna locating lugs **A**, **B** and **C**, which retain the RFID coil antenna in position on the manifold assembly.

Note: *It is usually easier if the RFID coil antenna is removed first from the single antenna locating lug **A** at the top of the manifold assembly.*

13.5 Carefully manoeuvre the RFID coil antenna over the motor mounting bracket, around the stepper motor cable and off of the manifold assembly.

13.6 Carry out a continuity test on the new RFID coil antenna (Fig 46, Item 20), as follows:

13.6.1 Measure the resistance between the pins on the 2-way connector at the end of the flying lead on the RFID coil antenna.

13.6.2 If there is a very low resistance, the new RFID coil antenna is acceptable and can be installed onto the manifold assembly.

13.6.3 If there is a high resistance, then the new RFID coil antenna is damaged and should be discarded.

13.7 Position the new RFID coil antenna on top of the manifold assembly, with the flying lead on the RFID coil antenna adjacent to the micro switch on the manifold assembly.

13.8 Carefully manoeuvre the RFID coil antenna around the stepper motor cable and over the motor mounting bracket on the manifold assembly.

13.9 By carefully manoeuvring the RFID coil antenna, install it over the three antenna locating lugs **A**, **B** and **C**, to retain the RFID coil antenna in position on the manifold assembly.

Note: *It is usually easier if the RFID coil antenna is installed first over the two antenna locating lugs B and C at the bottom of the manifold assembly.*

13.10 Install a new cable tie (Fig 46, Item 30) over the RFID coil antenna and the antenna locating lug **C** (Refer to Figure 46).

Note: *If antenna locating lug **C** is damaged, install the cable tie over antenna locating lug **B**.*

13.11 Connect the two red wire connectors onto the microswitch terminals on the manifold assembly (Refer to Figures 43 and 46).

Note: *Make sure the red wire connectors are installed on the correct microswitch terminals - there is a third unused terminal on the microswitch. The two red wires are interchangeable.*

13.12 Make sure the 6-way cable connector is pushed fully onto the stepper motor connector.

13.13 Carry out a second continuity test on the RFID coil antenna, as detailed in Para 13.6.

13.14 Install the manifold assembly to the pump (Refer to Page 85, Section 12).

14 Removing the Silencer Bag Assembly

14.1 Remove the manifold assembly from the pump (Refer to Page 85, Section 11).

14.2 Remove the manifold assembly tube (Fig 42, Item 30) from the silencer bag assembly (Fig 42, Item 50).

Note: *This tube was previously connected to the manifold assembly (Fig 42, Item 10).*

14.3 Remove the silencer bag assembly from the compressor assembly tube (Fig 42, Item 60).

Note: *Leave the compressor assembly tube connected to the compressor assembly.*

15 Installing the Silencer Bag Assembly

15.1 Install the spigot of the new silencer bag assembly (Fig 42, Item 50) onto the compressor assembly tube (Fig 42, Item 60).

Note: *Make sure the orientation of the silencer bag is as shown in Figure 47.*

15.2 Install the manifold assembly tube (Fig 42, Item 30) onto the other spigot on the silencer bag assembly.

Note: *Make sure the spigots on the silencer bag assembly are pushed fully into the tubes.*

15.3 Install the manifold assembly to the pump (Refer to Page 85, Section 12).

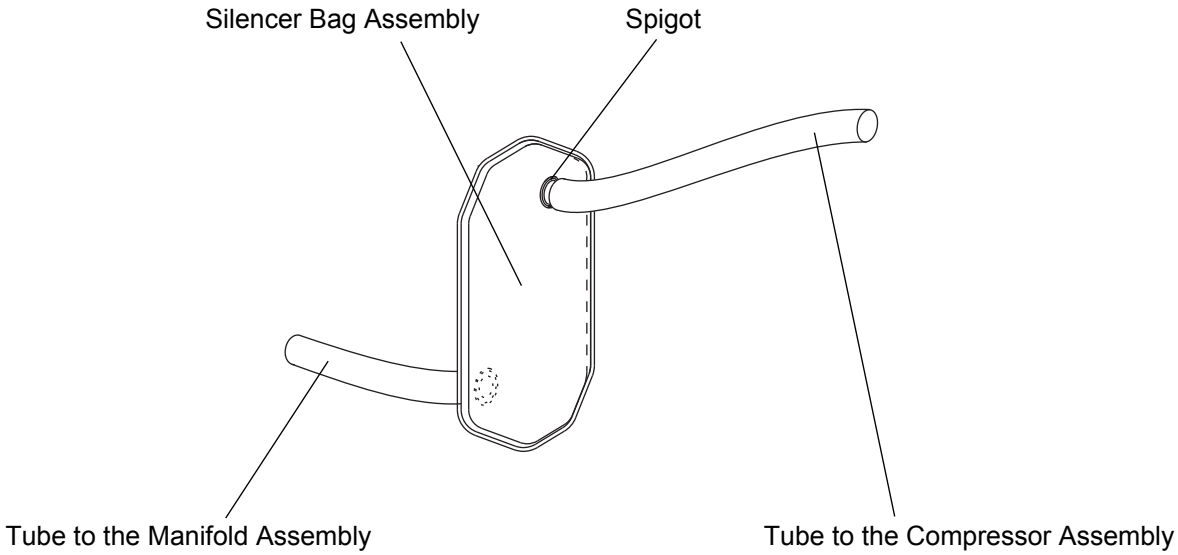


Figure 47 - Silencer Bag Assembly Orientation

16 Replacing the O-Rings on the Manifold Assembly

Note: *The O-rings can be replaced without opening the pump.*

16.1 Using a flat-bladed screwdriver, remove the three O-rings (Fig 48, Item 10) from the outlet ports on the manifold assembly (Fig 48, Item 20).

16.2 Carefully push the three new O-rings (Fig 48, Item 10) onto the outlet ports on the manifold assembly.

Note: *Make sure each O-ring is located centrally in the slot at the outer end of the outlet port.*

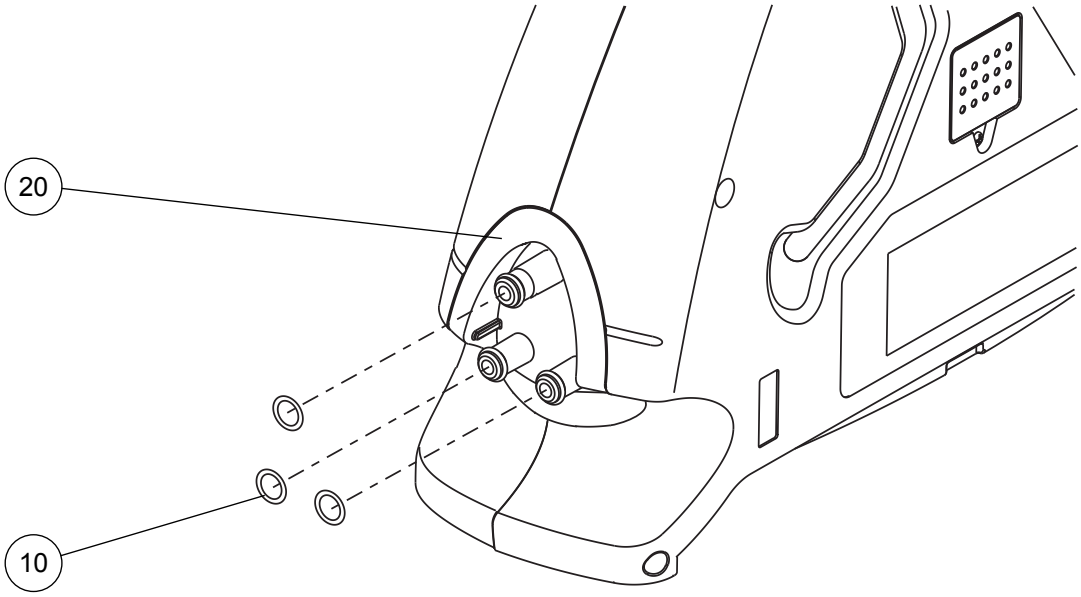


Figure 48 - Replacing the O-Rings on the Manifold Assembly

Table 16 - Manifold Assembly O-Ring Parts List

Item	Part Number	Description	Qty
10	630364	O-Ring, 6.8mm dia	3
20	630100	Manifold Assembly (including RFID Coil Antenna), Spares Item	1

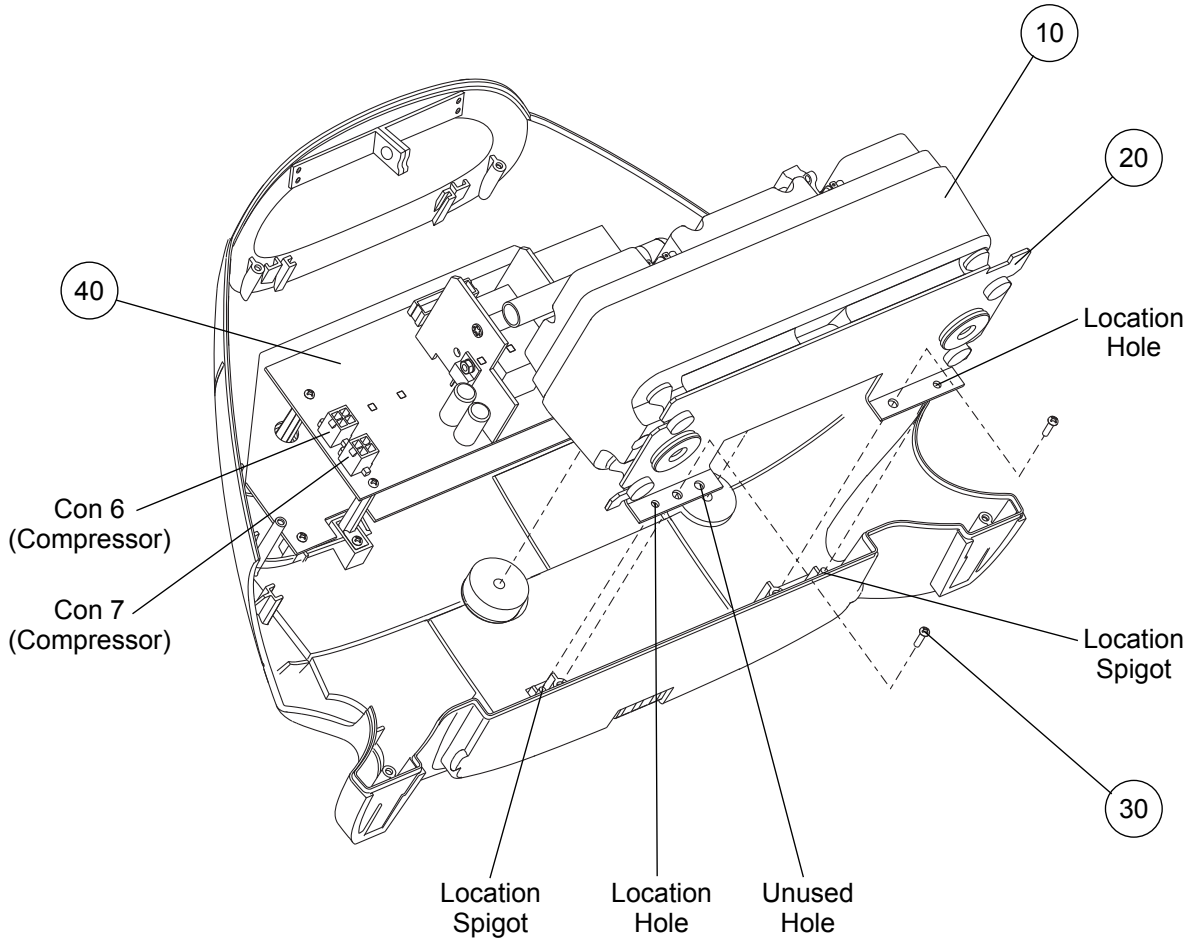


Figure 49 - Replacing the Compressor Assembly and Mounting Bracket

Table 17 - Compressor Assembly and Mounting Bracket

Item	Part Number	Description	Qty
10	509051	Compressor Assembly, Series 6, 5.5V 50/60Hz	1
20	507316	Compressor Mounting Bracket	1
30	FAS218	Screw, 4mm dia x 12 Pan Head	2
40	507058 507137	Power Supply PCB (superseded by 507137) Power Supply PCB (Printed Circuit Board) Assembly	1

17 Removing the Compressor Assembly and Mounting Bracket

17.1 Remove the manifold assembly from the pump (Refer to Page 85, Section 11).

17.2 Remove the silencer bag assembly from the large diameter tube on the top of the compressor assembly (Refer to Page 90, Section 14).

17.3 Disconnect the two compressor cable connectors (Fig 49, PCB Con 6 and 7) from the power supply PCB assembly (Fig 49, Item 40).

17.4 Remove the two screws (Fig 49, Item 30), and lift the compressor assembly and mounting bracket (Fig 49, Items 10 and 20) out of the front case.

Note: *The large diameter tube to the silencer bag assembly tube remains connected to the compressor assembly.*

18 Installing the Compressor Assembly and Mounting Bracket

Note: *Refer to Figure 42 for a view of the completed installation of the compressor assembly and mounting bracket in the pump.*

18.1 Before installing the compressor assembly and mounting bracket (Fig 49, Items 10 and 20), check the following parts are installed correctly on it:

18.1.1 The air inlet filter and air inlet filter holder.

18.1.2 The large diameter tube (to the silencer bag assembly, Fig 42, Item 60).

18.1.3 The eight crimp connectors (to the power supply PCB assembly, Fig 42, PCB Con 6 and 7).

18.2 Put the compressor assembly and mounting bracket into the front case.

Note: *Make sure the two locating holes at the outer ends of the mounting bracket are installed over the corresponding location spigots “A” and “B” in the front case (Refer to Figures 42 and 49).*

Note: *Make sure the wires from the power supply PCB assembly to the battery pack connector do not lie on top of the circular compressor support rubbers (Refer to Figure 53).*

18.3 Install the two screws (Fig 49, Item 30) through the mounting bracket (Fig 49, Item 30) and into the front case.

Note: *One hole in the left side of the mounting bracket is not used (Refer to Figure 49).*

18.4 Connect the two compressor cable connectors (Fig 42, PCB Con 6 and 7 and Fig 49, PCB Con 6 and 7) onto the power supply PCB assembly (Fig 49, Item 40).

18.5 Install the silencer bag assembly onto the compressor assembly tube (Refer to Page 90, Section 15).

18.6 Install the manifold assembly into the pump (Refer to Page 85, Section 12).

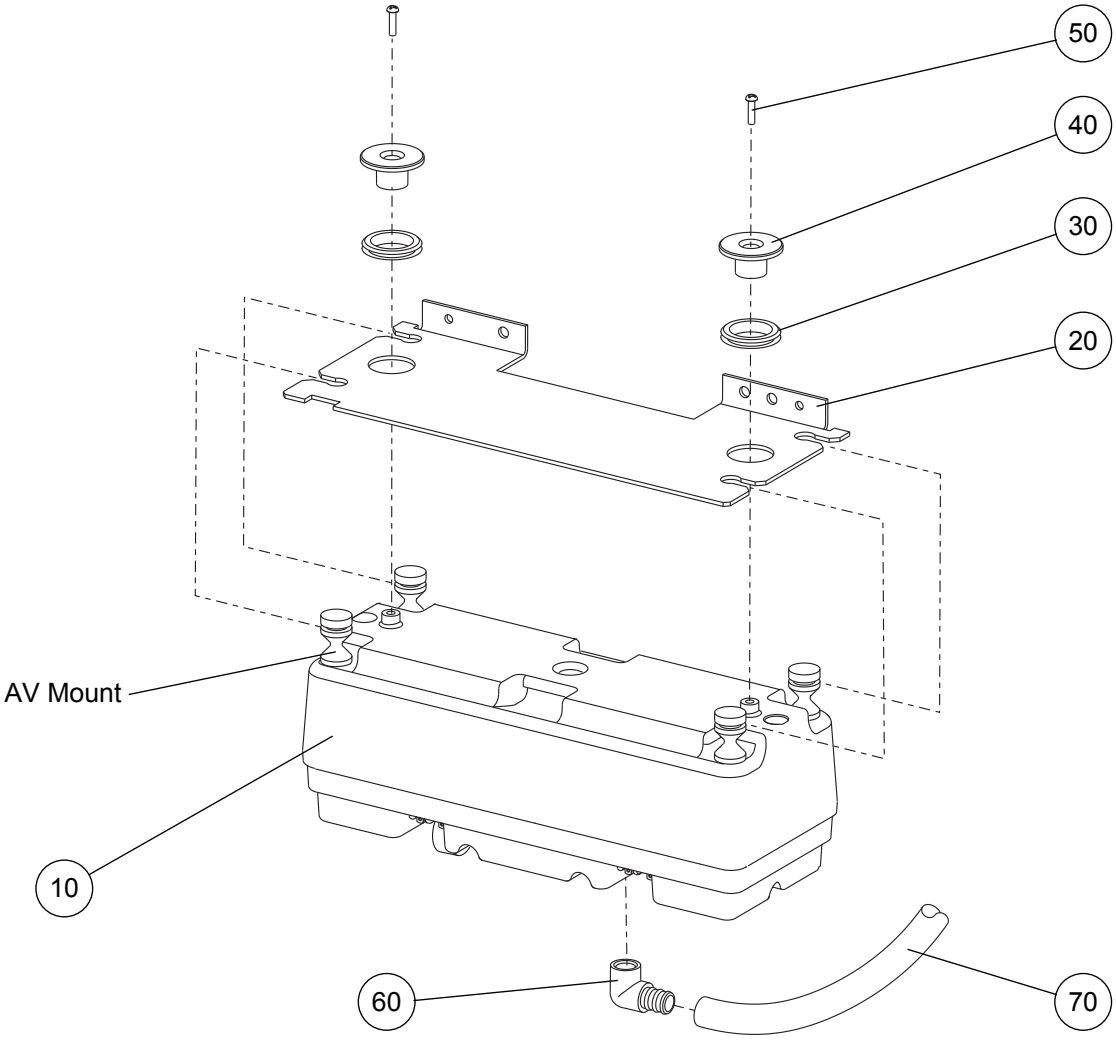


Figure 50 - Removing the Compressor Assembly from the Mounting Bracket

Table 18 - Compressor Assembly and Mounting Bracket Parts List

Item	Part Number	Description	Qty
10	509051	Compressor Assembly, Series 6, 5.5V 50/60Hz	1
20	507316	Compressor Mounting Bracket	1
30	507380	Compressor Bracket Grommet	2
40	507317	Compressor Bump Stop	2
50	FAS223	Screw, 3 dia x 10 Pan Head	2
60	630335	Elbow	1
70	630334	Tube, Compressor Assembly - Silencer Bag Assembly	1

19 Removing the Compressor Assembly from the Mounting Bracket

19.1 Remove the compressor assembly and mounting bracket (together with the tube to the silencer bag assembly) from the pump (Refer to Page 93, Section 17).

19.2 Lay the compressor assembly (Fig 50, Item 10) and mounting bracket (Fig 50, Item 20) down with the mounting bracket on top (Refer to Figure 50).

19.3 Remove the two screws (Fig 50, Item 50) and compressor bump stops (Fig 50, Item 40) from the compressor assembly (Fig 50, Item 10) and mounting bracket (Fig 50, Item 20).

19.4 The compressor assembly is still attached to the mounting bracket via the four anti-vibration (AV) mounts. Separate the compressor assembly (together with the tube to the silencer bag assembly) from the mounting bracket, as follows (Refer to Figures 50 and 51):

19.4.1 Start at one corner of the compressor assembly.

19.4.2 Hold the compressor assembly, and push the mounting bracket in towards the centre of the compressor assembly.

19.4.3 At the same time, carefully push the AV mount in the opposite direction and out of the slot in the mounting bracket.

19.4.4 Repeat for the other three corners of the compressor assembly.

20 Installing the Compressor Assembly onto the Mounting Bracket

20.1 Lay the compressor assembly (Fig 50, Item 10) down with the AV mounts on top, and the two cables to the power supply PCB assembly at the front (Refer to Figure 51).

20.2 Lay the mounting bracket (Fig 50, Item 20) on top of the compressor assembly, with the angled part of the mounting bracket on top and at the back of the compressor assembly (Refer to Figure 51).

20.3 At one end of the compressor assembly, carefully push the grooved part of the two AV mounts into the slots in the mounting bracket (Refer to Figures 50 and 51).

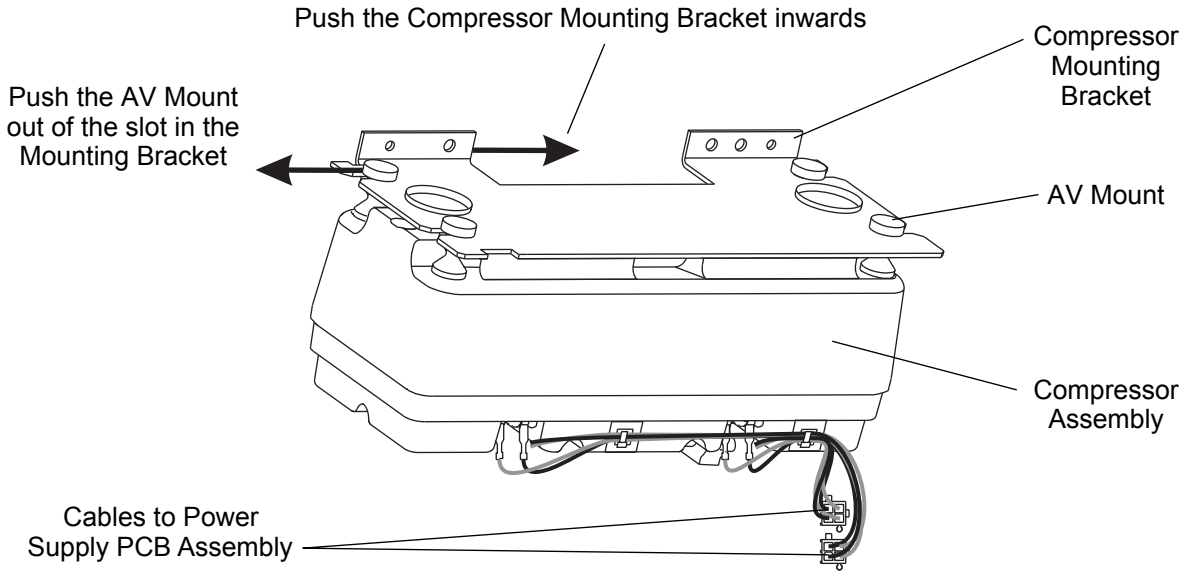
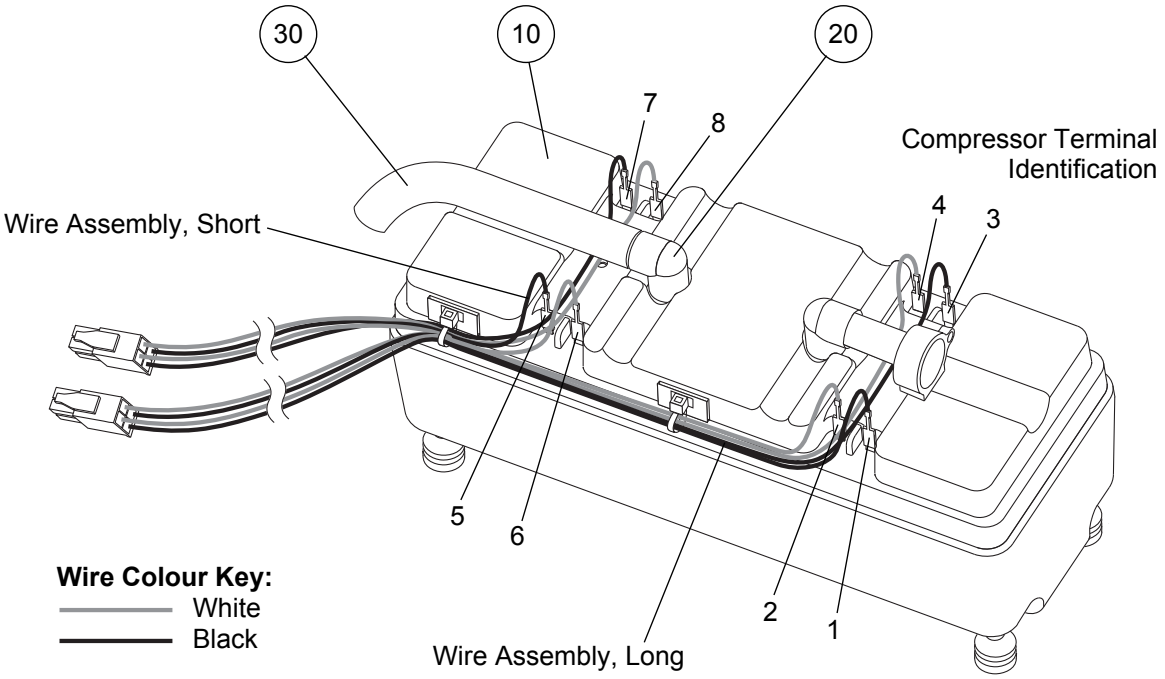

Push the Compressor Mounting Bracket inwards
Compressor Mounting Bracket
Push the AV Mount out of the slot in the Mounting Bracket
AV Mount
Compressor Assembly
Cables to Power Supply PCB Assembly

Figure 51 - Removing the AV Mounts from the Mounting Bracket



Wire Assembly Connections:

Short: White wires: 6 and 8
Black wires: 5 and 7

Long: White Wires: 2 and 4
Black Wires: 1 and 3

Figure 52 - Compressor Assembly

Table 19 - Compressor Assembly

Item	Part Number	Description	Qty
10	509051	Compressor Assembly, Series 6, 5.5V 50/60Hz	1
20	630335	Elbow	1
30	630334	Tube, Compressor Assembly - Silencer Bag Assembly	1

20.4 At the other end of the compressor assembly, do the following (Refer to Figure 51):

20.4.1 Hold the compressor assembly, and push the mounting bracket in towards the centre of the compressor assembly.

20.4.2 At the same time, carefully push the grooved part of the remaining two AV mounts into the slots in the mounting bracket.

20.5 Install the two compressor bump stops (Fig 50, Item 40) through the compressor bracket grommets (Fig 50, Item 30), and over the spigots in the compressor assembly.

20.6 Install the two screws (Fig 50, Item 50) to secure the compressor bump stops.

20.7 Install the compressor assembly and mounting bracket into the pump (Refer to Page 93, Section 18).

21 Replacing the Compressor Assembly

21.1 Remove the compressor assembly from the pump, and separate from the mounting bracket (Refer to Page 95, Section 19).

21.2 Remove the large diameter tube (to the silencer bag assembly, Fig 52, Item 30) and the elbow (Fig 52, Item 20) from the outlet on the top of the compressor assembly (Fig 52, Item 10).

21.3 Install the large diameter tube (to the silencer bag assembly, Fig 52, Item 30) and the elbow (Fig 52, Item 20) onto the outlet on the top of the new compressor assembly (Fig 52, Item 10).

21.4 Check that the crimp connectors on the two wire assemblies (long and short) are correctly connected to the compressor assembly. Refer to Figure 52 for the correct wire colours and compressor terminal connections.

Note: *The two wire assemblies are part of the compressor assembly.*

21.5 Install the compressor assembly onto the mounting bracket, and then into the pump (Refer to Page 95, Section 20).

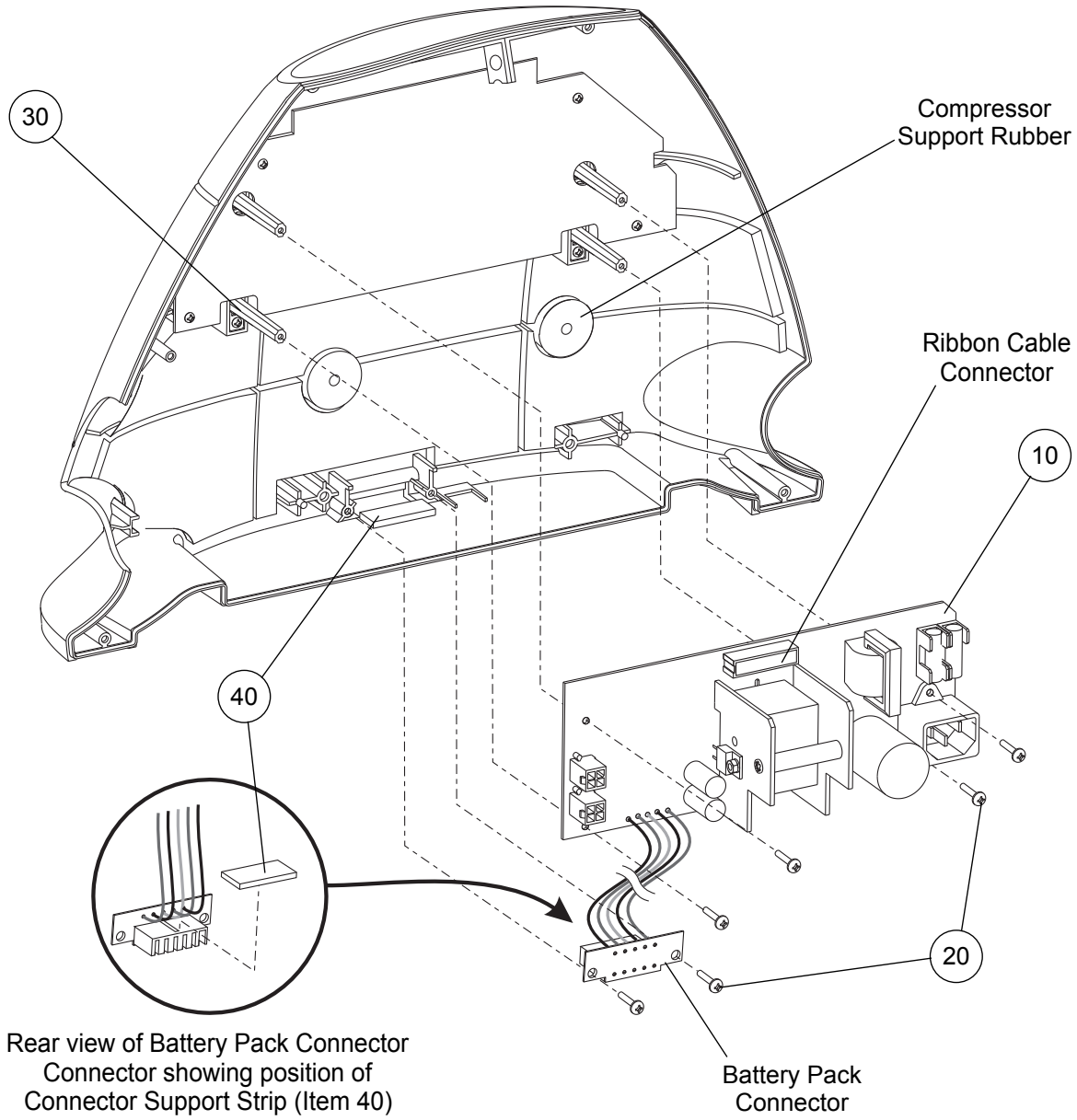


Figure 53 - Replacing the Power Supply PCB Assembly

Table 20 - Power Supply PCB Assembly Parts List

Item	Part Number	Description	Qty
10	507058 507137	Power Supply PCB (superseded by 507137) Power Supply PCB (Printed Circuit Board) Assembly	1
20	FAS223	Screw, 3 dia x 10 Pan Head	6
30	630318	PCB Mounting Pillar	4
40	507410	Connector Sealing Strip	2

22 Removing the Power Supply PCB (Printed Circuit Board) Assembly

WARNING: DO NOT CONNECT THE MAINS/POWER CORDSET TO THE POWER SUPPLY PCB ASSEMBLY, AND SWITCH ON THE MAINS/POWER SUPPLY, WHEN THE REAR CASE IS REMOVED FROM THE PUMP. VOLTAGES IN EXCESS OF 230 VOLTS RMS / 400 VOLTS DC ARE PRESENT ON THE POWER SUPPLY PCB ASSEMBLY AND CAN, IN CERTAIN CIRCUMSTANCES, BE LETHAL.

CAUTION: Electrostatic discharge can seriously damage the power supply PCB assembly. Adequate earthing precautions must be taken prior to handling it.

Note: *The power supply PCB assembly includes the battery pack connector, which is hard-wired to it.*

22.1 Remove the compressor assembly and mounting bracket from the pump (Refer to Page 93, Section 17).

22.2 Disconnect the ribbon cable connector (Refer to Figures 42 and 53) from the top of the power supply PCB assembly (Fig 53, Item 10).

22.3 Remove the two screws (Fig 53, Item 20) and the battery pack connector from the front case.

22.4 Remove the four screws (Fig 53, Item 20) and the power supply PCB assembly (Fig 53, Item 10) from the four PCB mounting pillars (Fig 53, Item 30).

23 Installing the Power Supply PCB (Printed Circuit Board) Assembly

WARNING: DO NOT CONNECT THE MAINS/POWER CORDSET TO THE POWER SUPPLY PCB ASSEMBLY, AND SWITCH ON THE MAINS/POWER SUPPLY, WHEN THE REAR CASE IS REMOVED FROM THE PUMP. VOLTAGES IN EXCESS OF 230 VOLTS RMS / 400 VOLTS DC ARE PRESENT ON THE POWER SUPPLY PCB ASSEMBLY AND CAN, IN CERTAIN CIRCUMSTANCES, BE LETHAL.

23.1 Put the power supply PCB assembly (Fig 53, Item 10) onto the four PCB mounting pillars (Fig 53, Item 30), and install the four screws (Fig 53, Item 20) to secure it.

23.2 Connect the ribbon cable connector (Refer to Figures 42 and 53) from the control PCB assembly onto the top of the power supply PCB assembly (Fig 53, Item 10).

23.3 If a new power supply PCB assembly is being installed, stick a new connector sealing strip (Fig 53, Item 40) to the back of the battery pack connector. If the original power supply PCB assembly is being re-installed, make sure the connector sealing strip is still stuck to the back of the battery pack connector (Refer to Figure 53).

23.4 Make sure there is a second connector sealing strip (Fig 53, Item 40) stuck to the front case, adjacent to the battery pack connector slot (Refer to Figure 53).

23.5 Insert the battery pack connector into the slot in the front case, and install the two screws (Fig 53, Item 20) to secure it.

Note: *Make sure the wires from the power supply PCB assembly to the battery pack connector do not lie on top of the circular compressor support rubbers (Refer to Figure 53).*

23.6 Install the compressor assembly and mounting bracket into the pump (Refer to Page 93, Section 18).

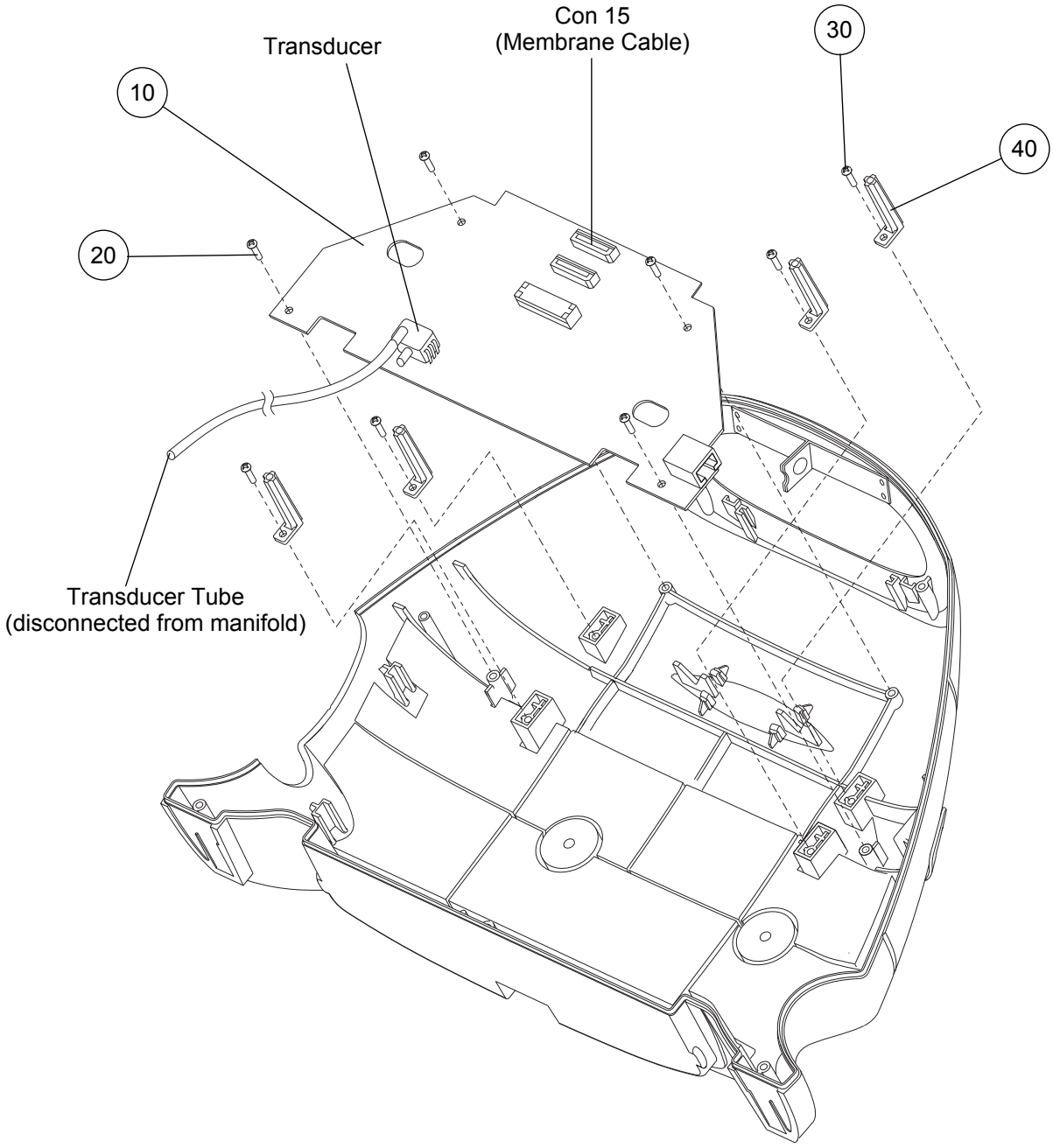


Figure 54 - Replacing the Control PCB Assembly

Table 21 - Control PCB Assembly Parts List

Item	Part Number	Description	Qty
10	630400 630140 654140	Control PCB (superseded by 630140, from serial number 0900058473 onwards) Control PCB Control PCB (Autofirm model only)	1
20	FAS145	Screw, 3 dia x 8 Pan Head	4
30	FAS223	Screw, 3 dia x 10 Pan Head	4
40	630318	PCB Mounting Pillar	4

24 Removing the Control PCB (Printed Circuit Board) Assembly

CAUTION: Electrostatic discharge can seriously damage the control PCB assembly. Prior to replacing it, adequate earthing precautions must be taken.

Note: *The transducer tube is part of the control PCB assembly.*

24.1 Remove the power supply PCB assembly from the pump (Refer to Page 99, Section 22).

24.2 Carefully pull the membrane cable out of the membrane connector on the control PCB assembly (Fig 54, PCB Con 15).

24.3 Remove the four screws (Fig 54, Item 20), and lift the control PCB assembly (Fig 54, Item 10) out of the front case.

Note: *Do not damage the transducer or transducer tube on the control PCB assembly as you remove it from the pump (Refer to Figure 54).*

25 Installing the Control PCB (Printed Circuit Board) Assembly

25.1 Make sure the transducer tube is pushed fully onto the top outlet on the transducer on the control PCB assembly (Refer to Figure 54).

CAUTION: Do not handle the transducer on the control PCB assembly unnecessarily. The transducer is a sensitive device. To avoid damage, put your finger at the back of the transducer while you push the tube onto the top outlet at the front of the transducer.

25.2 Put the control PCB assembly (Fig 54, Item 10) into the front case, over the PCB mounting pillars (Fig 54, Item 40), and install the four screws (Fig 54, Item 20) to secure it to the front case.

25.3 Carefully push the membrane cable into the membrane connector on the control PCB assembly (Fig 54, PCB Con 15).

25.4 Install the power supply PCB assembly into the pump (Refer to Page 99, Section 23).

26 Removing the PCB Mounting Pillars

26.1 Remove the control PCB assembly from the pump (Refer to Page 101, Section 24).

26.2 Remove the four screws (Fig 54, Item 30) and four PCB mounting pillars (Fig 54, Item 40) from the front case.

27 Installing the PCB Mounting Pillars

27.1 Install the four PCB mounting pillars (Fig 54, Item 40) and four screws (Fig 54, Item 30) into the front case.

27.2 Install the control PCB assembly into the pump (Refer to Page 101, Section 25).

28 Replacing the Battery on the Control PCB Assembly

The battery on the control PCB assembly provides power for the real time clock. This battery should not require replacement until after several years of continuous use. When the old battery is removed, the real time clock will lose its time and date settings. These settings can only be reloaded from a PC-based service tool, therefore the battery replacement procedure should only be carried out in an ArjoHuntleigh service environment.

Two different battery types are available depending on the version of the Control PCB. Always replace the battery with one of the same type.

28.1 Remove the control PCB assembly from the pump (Refer to Page 101, Section 24).

28.2 Cut and remove the cable tie (Fig 55, Item 20) which secures the battery (Fig 55, Item 10) to the control PCB assembly (Fig 55, Item 30), and move the battery a small distance away.

28.3 Put the new battery (Fig 55, Item 10) in the correct position on the control PCB assembly, adjacent to the old battery.

28.4 Secure the new battery to the control PCB assembly with a new cable tie (Fig 55, Item 20).

28.5 Disconnect the old battery and connect the new battery, as follows:

28.5.1 Disconnect the 2-pin battery cable connector from the battery connector on the control PCB assembly (Fig 55, PCB Con 6), and remove the battery.

28.5.2 Connect the 2-pin battery cable connector onto the control PCB assembly.

28.6 Install the control PCB assembly into the pump, and then re-assemble the pump (Refer to Page 101, Section 25).

28.7 To Set the Time and Date, refer to Chapter 4 “Testing”, Page 71, Section 17.

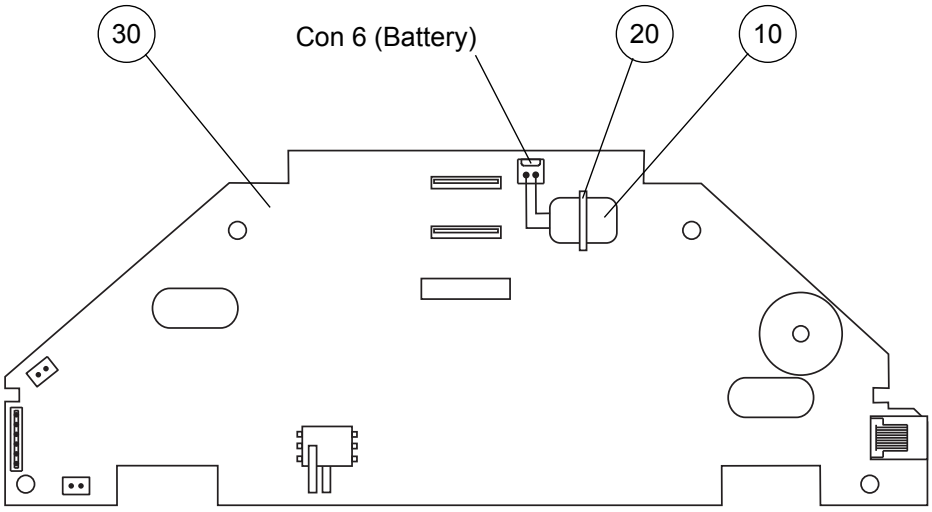


Figure 55 - Replacing the Rechargeable Battery

Table 22 - Rechargeable Battery Parts List

Item	Part Number	Description	Qty
10	151457 630600	Rechargeable Battery (*only for use with 630400 PCB*) 4.8 V 70mA battery pack (*only for use with 630140 PCB*)	1
20	BP196	Cable Tie	1
30	630400 630140 654140	Control PCB (superseded by 630140, from serial number 0900058473 onwards) Control PCB Control PCB (Autofirm model only)	1

29 Pump Labels

New labels are required when the Case Rear assembly is replaced. Replacement Serial Number labels are not available, so the old label must be carefully removed and reused.

Note: *Items 10 and 20 must be stuck on in the correct order and with the correct orientation.*

29.1 Stick the serial number label (Fig 56, Item 10) onto the rear case. Make sure the orientation of the text on the serial number label is correct (Refer to Figure 56).

29.2 Align the product label (Fig 56, Item 20) over the serial number label, and stick it onto the rear case. Make sure the orientation of the text on the product label is correct (Refer to Figure 56) and that the serial number can be seen through the clear window in the product label.

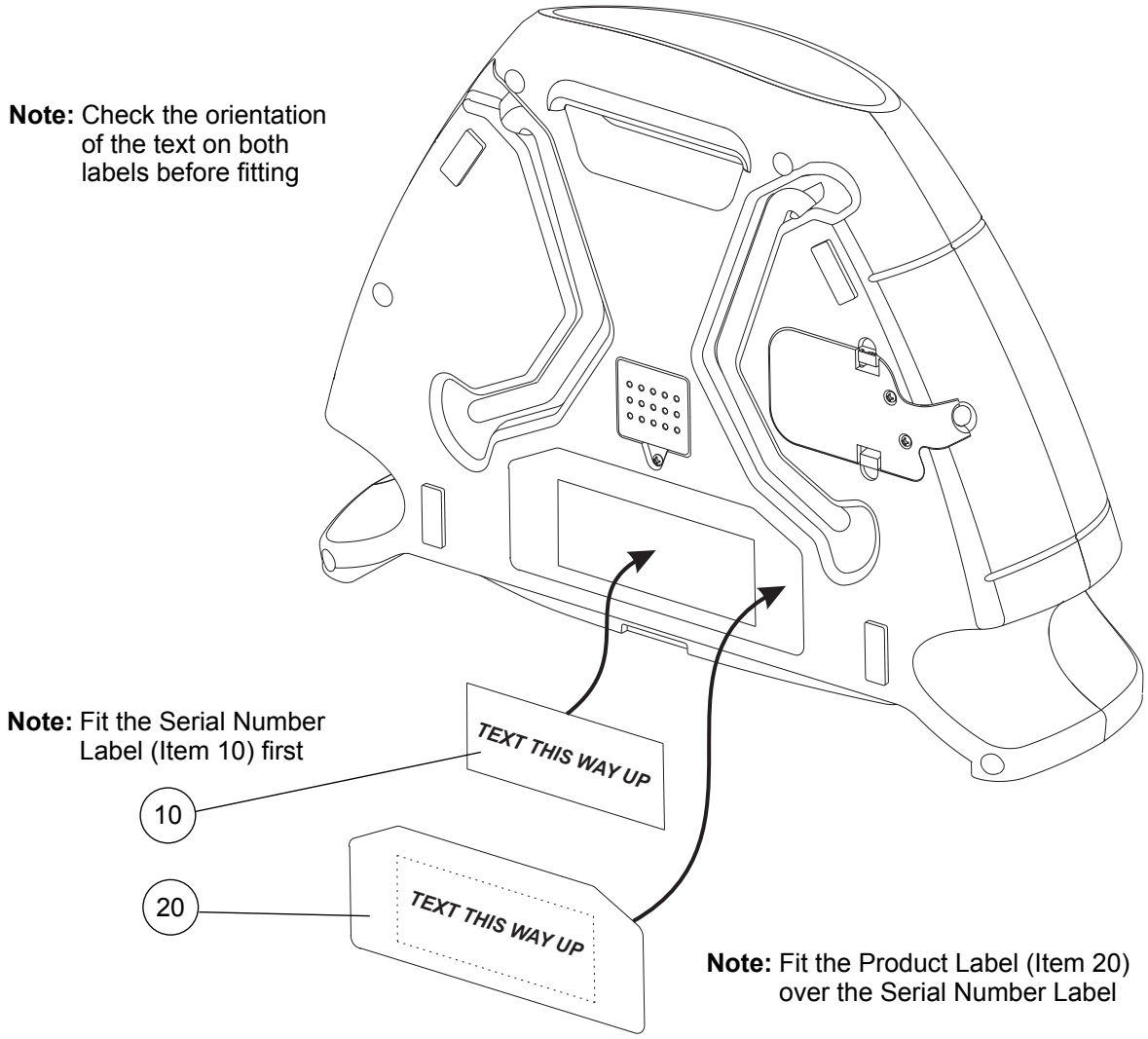

Note: Check the orientation of the text on both labels before fitting
Note: Fit the Serial Number Label (Item 10) first
TEXT THIS WAY UP
10
20
TEXT THIS WAY UP
Note: Fit the Product Label (Item 20) over the Serial Number Label

Figure 56 - Pump Labels

Table 23 - Pump Label Parts List

Item	Part Number	Description	Qty
10	REF	Serial Number Label	1
20	LAB314	Pump Product Label - serial numbers earlier than 1200028327	1
20	LAB705	Pump Product Label - serial numbers 1200028327 to current	1

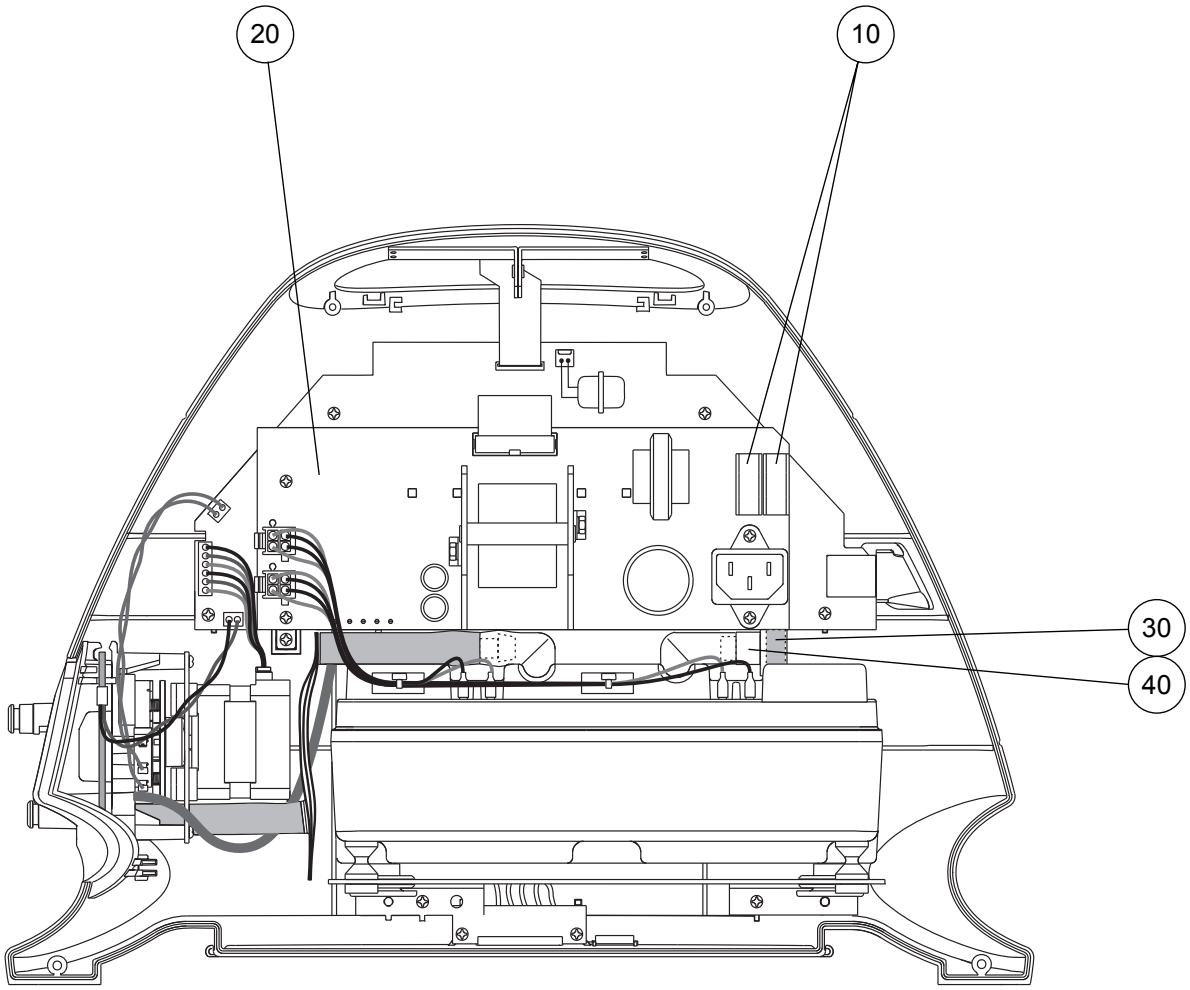


Figure 57 - Replacing the Mains/Power Fuses and Compressor Filter

Table 24 - Mains/Power Fuse and Compressor Filter Parts List

Item	Part Number	Description	Qty
10	507422	Fuse, 3.15A 20mm Type T	2
20	507058 507137	Power Supply PCB (superseded by 507137) Power Supply PCB (Printed Circuit Board) Assembly	1
30	509317	Air Inlet Filter, Compressor Assembly	1
40	509320	Air Inlet Filter Holder	1

30 Replacing the Mains/Power Fuses on the Power Supply PCB Assembly

WARNING: MAKE SURE THE REPLACEMENT FUSES ARE THE CORRECT TYPE AND RATING, OR THE ELECTRICAL SAFETY OF THE PUMP MAY BE IMPAIRED.

Note: *Always replace both fuses even if only one has failed.*

30.1 Remove the rear case from the front case (Refer to Page 80, Section Note:).

30.2 Lay the front case down with the inside surface pointing upwards.

30.3 Un-clip the plastic cover on one of the fuse holders on the power supply PCB assembly (Fig 57, Item 20), and remove the fuse (Fig 57, Item 10).

30.4 Install the new fuse (Fig 57, Item 10) into the fuse holder, and clip the plastic cover onto the fuseholder.

30.5 Repeat for the second fuse (Fig 57, Item 40).

30.6 Install the rear case onto the front case (Refer to Page 81, Section 8).

31 Replacing the Air Inlet Filter on the Compressor Assembly

31.1 Remove the rear case from the front case (Refer to Page 80, Section Note:).

31.2 Lay the front case down with the inside surface pointing upwards.

31.3 Using a pair of tweezers, remove the air inlet filter (Fig 57, Item 30) from the air inlet filter holder (Fig 57, Item 40).

31.4 Insert a new air inlet filter (Fig 57, Item 30) into the air inlet filter holder.

Note: *Make sure the air inlet filter is pushed fully into the air inlet filter holder.*

31.5 Install the rear case onto the front case (Refer to Page 81, Section 8).

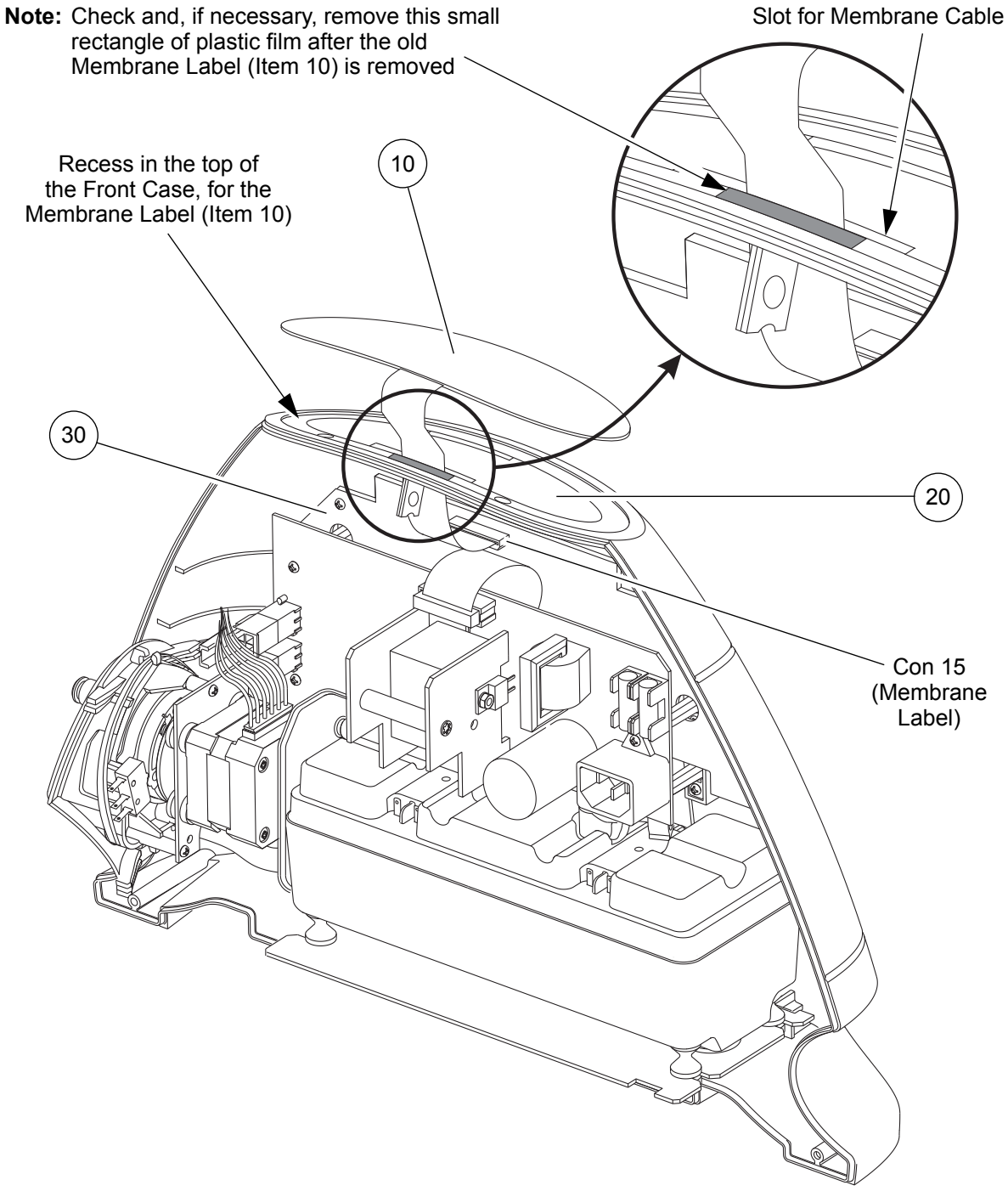

Note: Check and, if necessary, remove this small rectangle of plastic film after the old Membrane Label (Item 10) is removed
Slot for Membrane Cable
Recess in the top of the Front Case, for the Membrane Label (Item 10)
10
30
20
Con 15 (Membrane Label)

Figure 58 - Replacing the Membrane Label

Table 25 - Membrane Label Parts List

Item	Part Number	Description	Qty
10	LAB392 LAB402	Membrane Label, Blue, Iconised (without Autofirm button) Membrane Label, Blue, Iconised (current with Autofirm button)	1
20	630328	LCD Window Cover	1
30	630400 630140 654140	Control PCB (superseded by 630140, from serial number 0900058473 onwards) Control PCB Control PCB (Autofirm model only)	1

32 Removing the Membrane Label

32.1 Remove the rear case from the front case (Refer to Page 81, Section 7).

32.2 Pull the membrane cable out of the membrane connector on the control PCB assembly (Fig 58, PCB Con 15).

32.3 Using a flat-bladed screwdriver or similar tool, lift up the edge of the membrane label (Fig 58, Item 10) and carefully remove it from the LCD window cover (Fig 58, Item 20).

Note: *Do not damage the LCD window cover or recess in the top of the front case.*

33 Installing the Membrane Label

33.1 If the new membrane label (Fig 58, Item 10) is being installed onto an “old” front case, make sure the LCD window cover (Fig 58, Item 20) and recess in the top of the front case are clean (Refer to Figure 58).

Note: *When the old membrane label is removed, a small rectangle of plastic film can remain stuck to the recess in the top of the front case, adjacent to the membrane cable slot in the LCD window cover. Remove this plastic film, and clean the LCD window cover and recess in the top of the front case (Refer to Figure 58).*

33.2 Before you remove the protective sheet from the back of the new membrane label (Fig 58, Item 10), check the following:

- The correct orientation of the membrane label on the top of the pump (Refer to Figure 59).
- The position of the slot in the LCD window cover (Fig 58, Item 20) through which the membrane cable passes (Refer to Figure 58).

33.3 Remove the protective sheet from the back of the membrane label.

33.4 Pass the membrane cable through the slot in the LCD window cover.

33.5 Carefully push the membrane cable into the membrane connector on the control PCB assembly (Fig 58, PCB Con 15).

33.6 Install the rear case onto the front case (Refer to Page 81, Section 8).

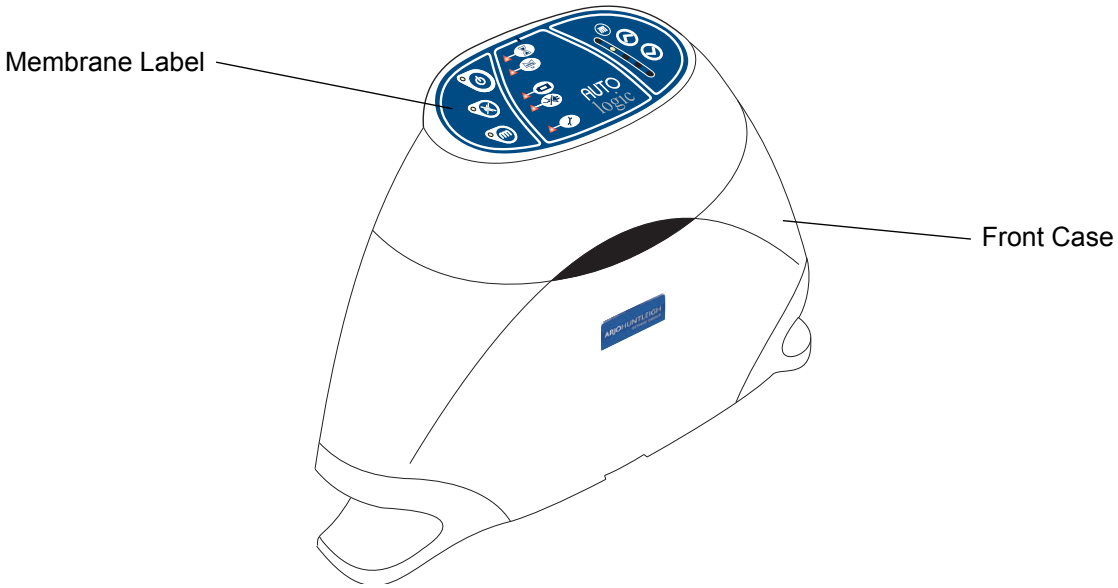


Figure 59 - Orientation of the Membrane Label

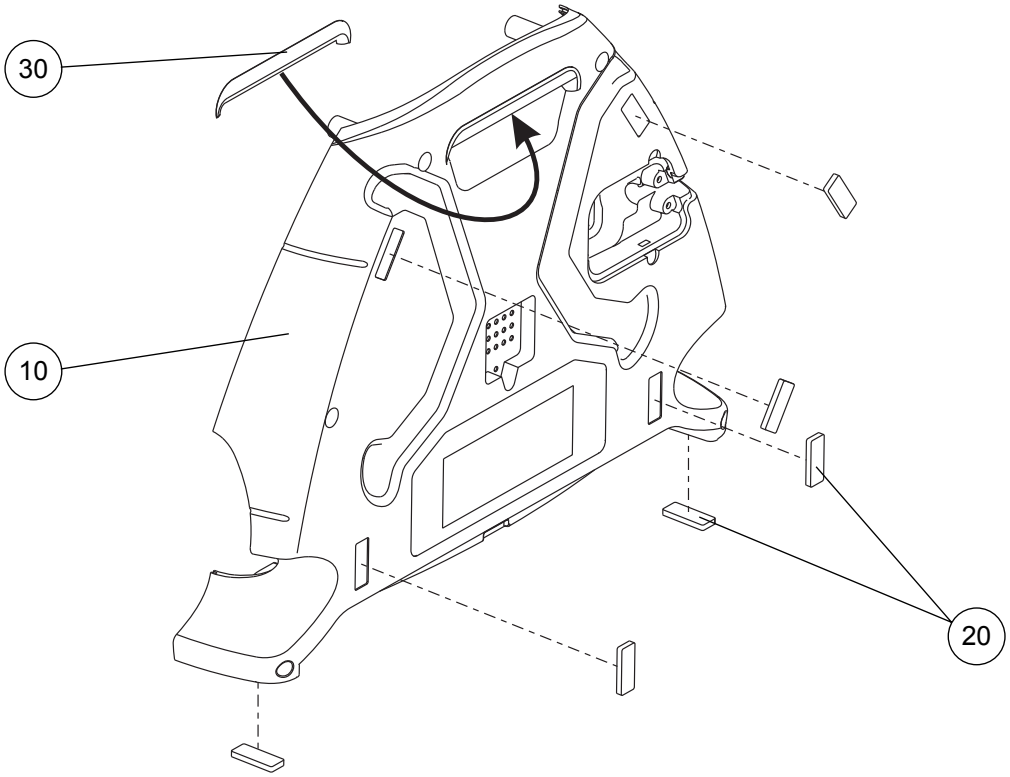


Figure 60 - Rear Case - Handle Insert and Rubber Feet

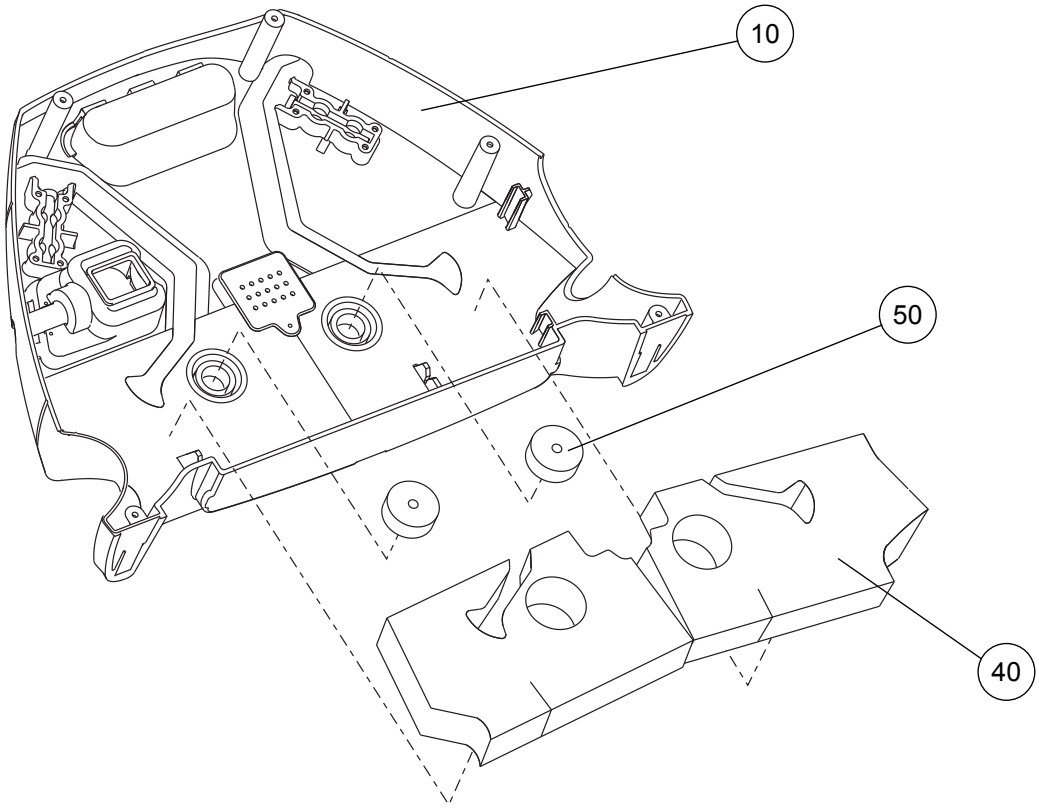


Figure 61 - Rear Case - Noise-Reduction Foam and Compressor Support Rubbers

34 Replacing the Rear Case

IMPORTANT:If an old style rear case (630321) is to be replaced with a new style rear case (630571), then the old style front case (630320) must also be replaced with the new style front case (630570) at the same time.
Refer to Page 115, "Replacing Both Pump Casings".

34.1 Remove the mains/power cordset from the pump (Refer to Page 79, Section 3).

34.2 Remove the air inlet filter from the rear case (Refer to Page 79, Section 5).

34.3 Remove the rear case from the front case (Refer to Page 80, Section Note:).

34.4 Remove the hooks and hook covers from the rear case (Refer to Page 83, Section 9).

34.5 Discard the old rear case (Fig 60, Item 10).

34.6 Lay the new rear case (Fig 60, Item 10) down with the outside surface pointing upwards.

34.7 If not already fitted, install the following components onto the rear case:

34.7.1 A new handle insert (Fig 60, Item 30).

34.7.2 Eight new rubber feet (Fig 60, Item 20).

34.8 Turn the rear case over so that the inside surface is pointing upwards.

34.9 Remove the backing strips, and install the following components onto the rear case:

34.9.1 New noise-reduction foam (Fig 61, Item 40).

Note: *Make sure that the noise-reduction foam is accurately located in the recesses in the rear case, between the strengthening ribs.*

34.9.2 Two new compressor support rubbers (Fig 61, Item 50).

34.10 Install the hooks and hook covers onto the rear case (Refer to Page 83, Section 10).

34.11 Install the rear case onto the front case (Refer to Page 81, Section 8).

34.12 Install the air inlet filter onto the rear case (Refer to Page 79, Section 6).

34.13 Install the mains/power cordset onto the pump (Refer to Page 79, Section 4).

34.14 Apply the serial number and product labels onto the rear case (Refer to Page 104, Section 29).

Table 26 - Rear Case Components

Item	Part Number	Description	Qty
10	630321 630571	Rear Case (Moulding only) - old style Rear Case (Moulding only) - new style	1
20	507413	Rubber Foot	6
30	630330	Handle Insert	1
40	630383	Noise-Reduction Foam, Rear Case	1
50	BP027	Compressor Support Rubber	2

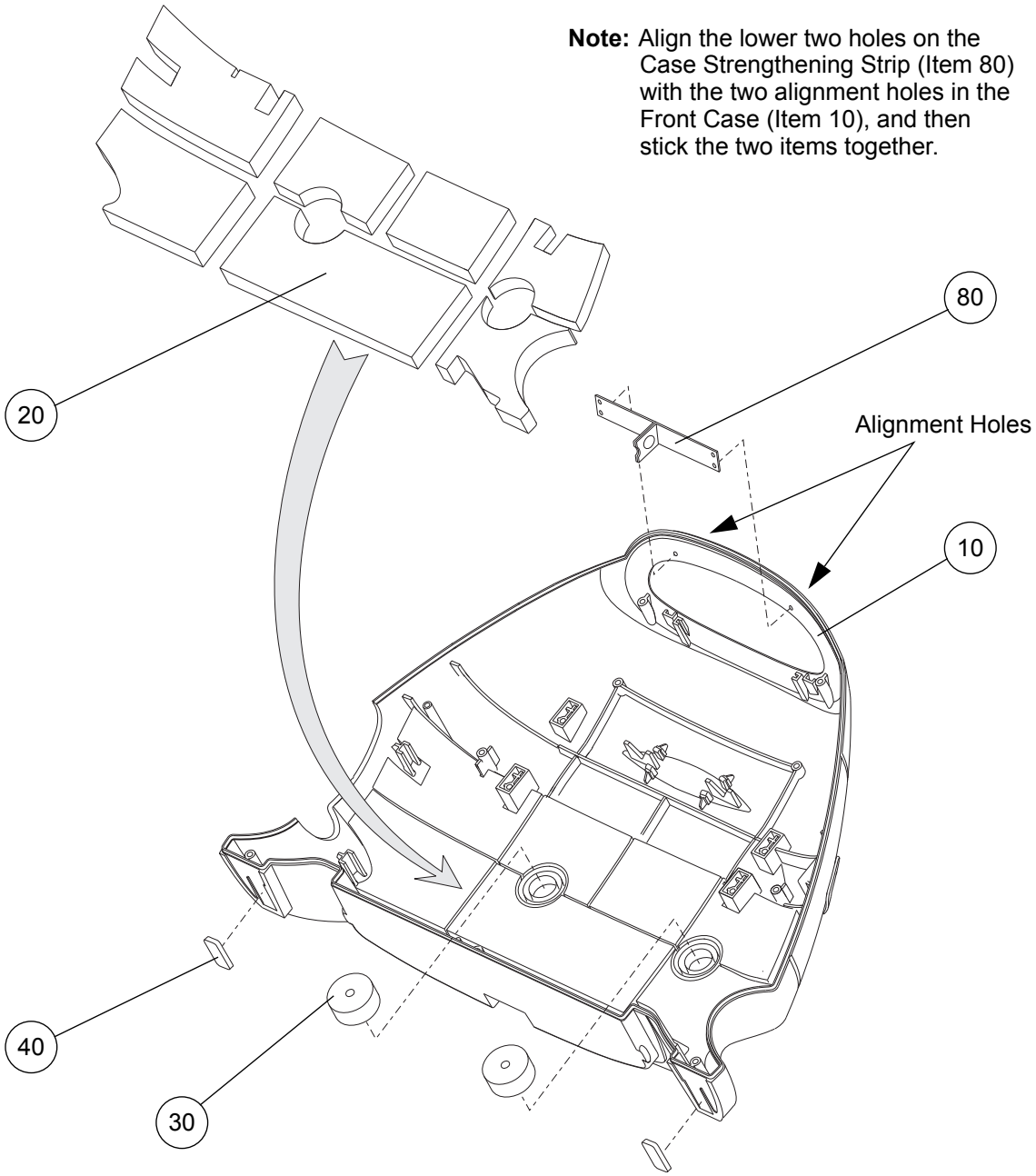

Note: Align the lower two holes on the Case Strengthening Strip (Item 80) with the two alignment holes in the Front Case (Item 10), and then stick the two items together.
80
20
Alignment Holes
10
40
30

Figure 62 - Front Case - Noise-Reduction Foam, Compressor Support Rubbers and Feet

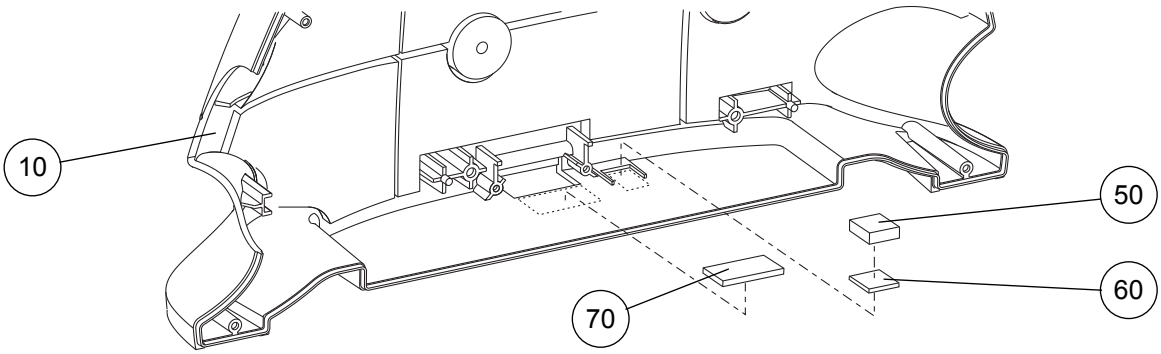


Figure 63 - Front Case - Ferrite Magnet, Mounting Pad and Connector Sealing Strip

35 Replacing the old style ‘Huntleigh Healthcare’ Front Case

IMPORTANT: If an old style front case (630320) is to be replaced with a new style front case (630570), then the old style rear case (630570) must also be replaced with the new style rear case (630571) at the same time.
Refer to Page 115, "Replacing Both Pump Casings".

35.1 Remove the mains/power cordset from the rear case (Refer to Page 79, Section 3).

35.2 Remove the rear case from the front case (Refer to Page 80, Section Note:).

35.3 Remove the following components from the front case:

35.3.1 The manifold assembly (Refer to Page 85, Section 11).

35.3.2 The compressor assembly and mounting bracket (Refer to Page 93, Section 17).

35.3.3 The power supply PCB assembly, together with the external battery connector (Refer to Page 99, Section 22).

35.3.4 The control PCB assembly (Refer to Page 101, Section 24).

35.3.5 The PCB mounting pillars (Refer to Page 101, Section 26).

35.4 Discard the old front case (Fig 62, Item 10).

35.5 Lay the replacement front case (Fig 62, Item 10) down with the inside surface pointing upwards.

35.6 Install the following self-adhesive components onto the inside of the front case:

35.6.1 New noise-reduction foam (Fig 62, Item 20).

Note: *Make sure that the noise-reduction foam is accurately located in the recesses in the rear case, between the strengthening ribs.*

35.6.2 Two new compressor support rubbers (Fig 62, Item 30).

35.6.3 Two new rubber feet (Fig 62, Item 40).

35.6.4 The magnet mounting pad (Fig 63, Item 60), in the appropriate slot in the front case.

35.6.5 The ferrite magnet (Fig 63, Item 50) onto the ferrite mounting pad.

Note: *Make sure the ferrite magnet and magnet mounting pad are aligned with the sides of the slot in the front case.*

Table 27 - Old Style Front Case - Internal Components

Item	Part Number	Description	Qty
10	630320	Front Case (Moulding only) - old style	1
20	630373	Noise-Reduction Foam, Front Case	1
30	BP027	Compressor Support Rubber	2
40	507413	Rubber Foot	2
50	BP042	Ferrite Magnet	1
60	507386	Magnet Mounting Pad	1
70	507410	Connector Sealing Strip	1
80	630399	Case Strengthening Strip, Self-Adhesive	1

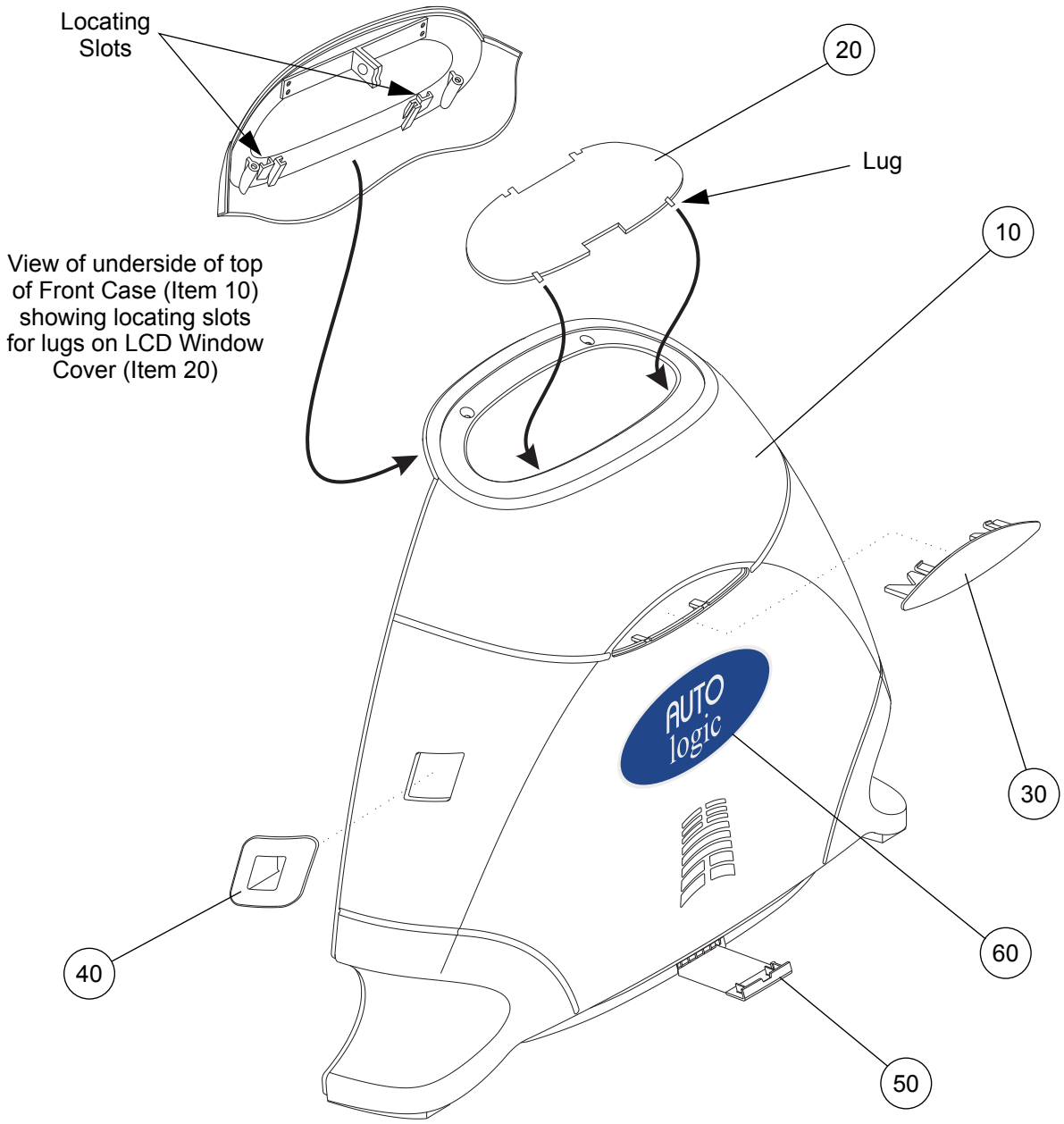


Figure 64 - Old Style Front Case - LCD Window, LED Lens, Grommet and Battery Socket Cover

Table 28 - Front Case - External Components

Item	Part Number	Description	Qty
10	630320	Front Case (Moulding only) - old style	1
20	630328	Insert Membrane Support	1
30	630324	IrDA LED Lens	1
40	630327	Grommet, for optional Patient Handset	1
50	630319	Battery Socket Cover	1
60	630398	Pump Label, Auto Logic	1

35.7 Install the self-adhesive case strengthening strip (Fig 62, Item 80) onto the inside of the front case, as follows:

35.7.1 Remove the protective sheet from the back of the case strengthening strip.

35.7.2 Align the lower two holes on the case strengthening strip with the two alignment holes in the front case (Refer to Figure 62).

Note: *There are four holes on the case strengthening strip so that it can be installed either way round.*

Note: *Make sure the case strengthening strip does not obstruct the cutout in the top of the front case for the LCD window cover (Refer to Figure 64).*

35.7.3 Firmly press the case strengthening strip onto the inside of the front case to secure it.

35.8 Turn the rear case over so that the outside surface is pointing upwards.

35.9 Install the following components onto the outside of the front case:

35.9.1 A new IrDA LED lens (Fig 64, Item 30). Push the lens until it clicks securely into place.

Note: *The IrDA LED lens is asymmetric and can only be installed one way.*

35.9.2 A new patient handset grommet (Fig 64, Item 40).

35.9.3 A new self-adhesive **Auto Logic** pump label (Fig 64, Item 60).

Note: *Make sure the pump label is centralised in the position shown in Figure 64.*

35.10 Install a new LCD window cover (Fig 64, Item 20) into the top of the front case, as follows (Refer to Figure 64):

35.10.1 Insert the side of the LCD window cover with the two lugs through the top of the front case, from the outside.

35.10.2 Insert the lugs into the corresponding slots in the underside of the top of the front case.

35.10.3 Lower the other side of the LCD window cover onto the top of the front case, and gently push it down until it clicks into place.

35.10.4 If necessary, the LCD window cover can be removed from the old front case and installed into the new front case. Remove the old LCD window cover, as follows:

35.10.4.1 Remove the membrane label (Refer to Page 108, Section 32).

35.10.4.2 Remove the LCD window cover, as the reverse procedure to that detailed in Para 35.10.1 to Para 35.10.3 (above).

35.11 Install the following components into the front case:

35.11.1 The PCB mounting pillars (Refer to Page 101, Section 27).

35.11.2 The control PCB assembly (Refer to Page 101, Section 25).

35.11.3 The membrane label (Refer to Page 108, Section 33).

35.11.4 The power supply PCB assembly, together with the external battery connector (Refer to Page 99, Section 23).

35.11.5 Stick a new connector sealing strip (Fig 62, Item 70) to the front case, adjacent to the battery pack connector.

35.11.6 The compressor assembly and mounting bracket (Refer to Page 93, Section 18).

35.11.7 The manifold assembly (Refer to Page 85, Section 12).

35.11.8 A battery socket cover (Fig 64, Item 50).

35.12 Install the rear case onto the front case (Refer to Page 81, Section 8).

35.13 Install the mains/power cordset onto the pump (Refer to Page 79, Section 4).

36 Replacing Both Pump Casings

IMPORTANT: If either the old style front case (630320) or the old style rear case (630321) are to be replaced with new style case parts, then both must be replaced with new style parts (630570 and 630571) at the same time.

36.1 Remove the mains/power cordset from the rear case (Refer to Page 79, Section 3).

36.2 Remove the rear case from the front case (Refer to Page 80, Section Note:).

36.3 Remove the following components from the front case:

36.3.1 The manifold assembly (Refer to Page 85, Section 11).

36.3.2 The compressor assembly and mounting bracket (Refer to Page 93, Section 17).

36.3.3 The power supply PCB assembly, together with the external battery connector (Refer to Page 99, Section 22).

36.3.4 The control PCB assembly (Refer to Page 101, Section 24).

36.3.5 The PCB mounting pillars (Refer to Page 101, Section 26).

36.3.6 The IrDA lens (Fig 67, Item 20).

36.4 Discard the old front case (Fig 64, Item 10).

36.5 Lay the new front case (Fig 65, Item 10) down with the inside surface pointing upwards.

36.6 Install the following self-adhesive components onto the inside of the front case:

36.6.1 New noise-reduction foam (Fig 65, Item 20).

Note: *Make sure that the noise-reduction foam is accurately located in the recesses in the rear case, between the strengthening ribs.*

36.6.2 Two new compressor support rubbers (Fig 65, Item 30).

36.6.3 Two new rubber feet (Fig 65, Item 40).

36.6.4 The magnet mounting pad (Fig 66, Item 60), in the appropriate slot in the front case.

36.6.5 The ferrite magnet (Fig 66, Item 50) onto the ferrite mounting pad.

Note: *Make sure the ferrite magnet and magnet mounting pad are aligned with the sides of the slot in the front case.*

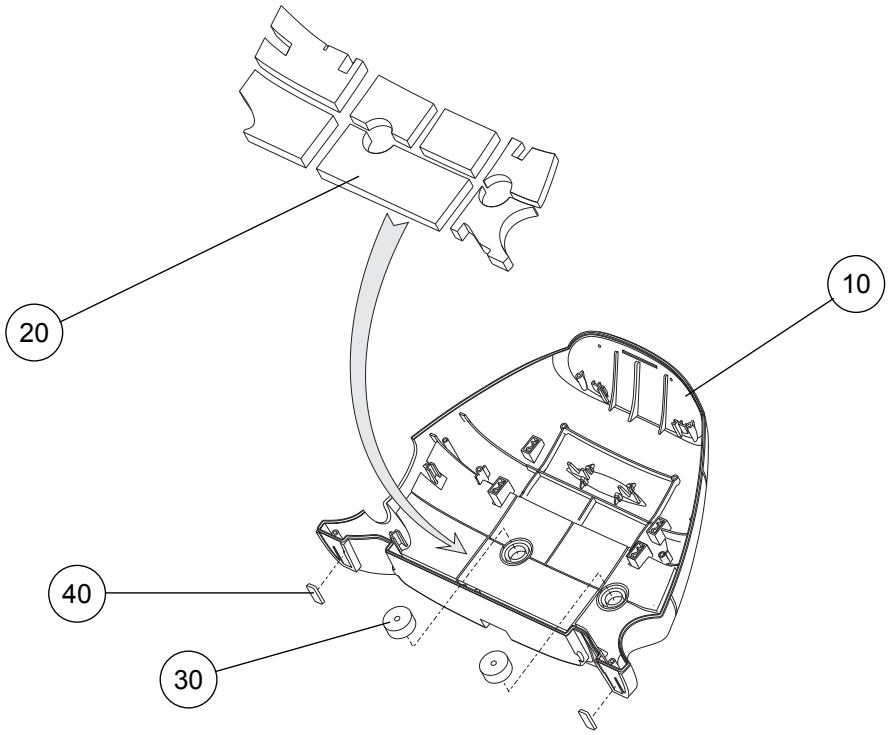


Figure 65 - New Style Front Case - Noise-Reduction Foam, Compressor Support Rubbers and Feet

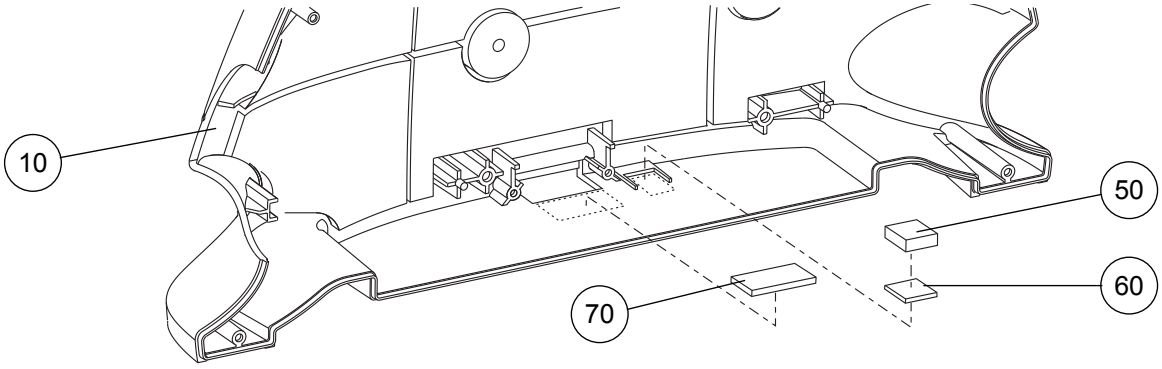


Figure 66 - New Style Front Case - Ferrite Magnet, Mounting Pad and Connector Sealing Strip

Table 29 - Front Case - Internal Components

Item	Part Number	Description	Qty
10	630570	Front Case (Moulding only) - new style	1
20	630373	Noise-Reduction Foam, Front Case	1
30	BP027	Compressor Support Rubber	2
40	507413	Rubber Foot	2
50	BP042	Ferrite Magnet	1
60	507386	Magnet Mounting Pad	1
70	507410	Connector Sealing Strip	1

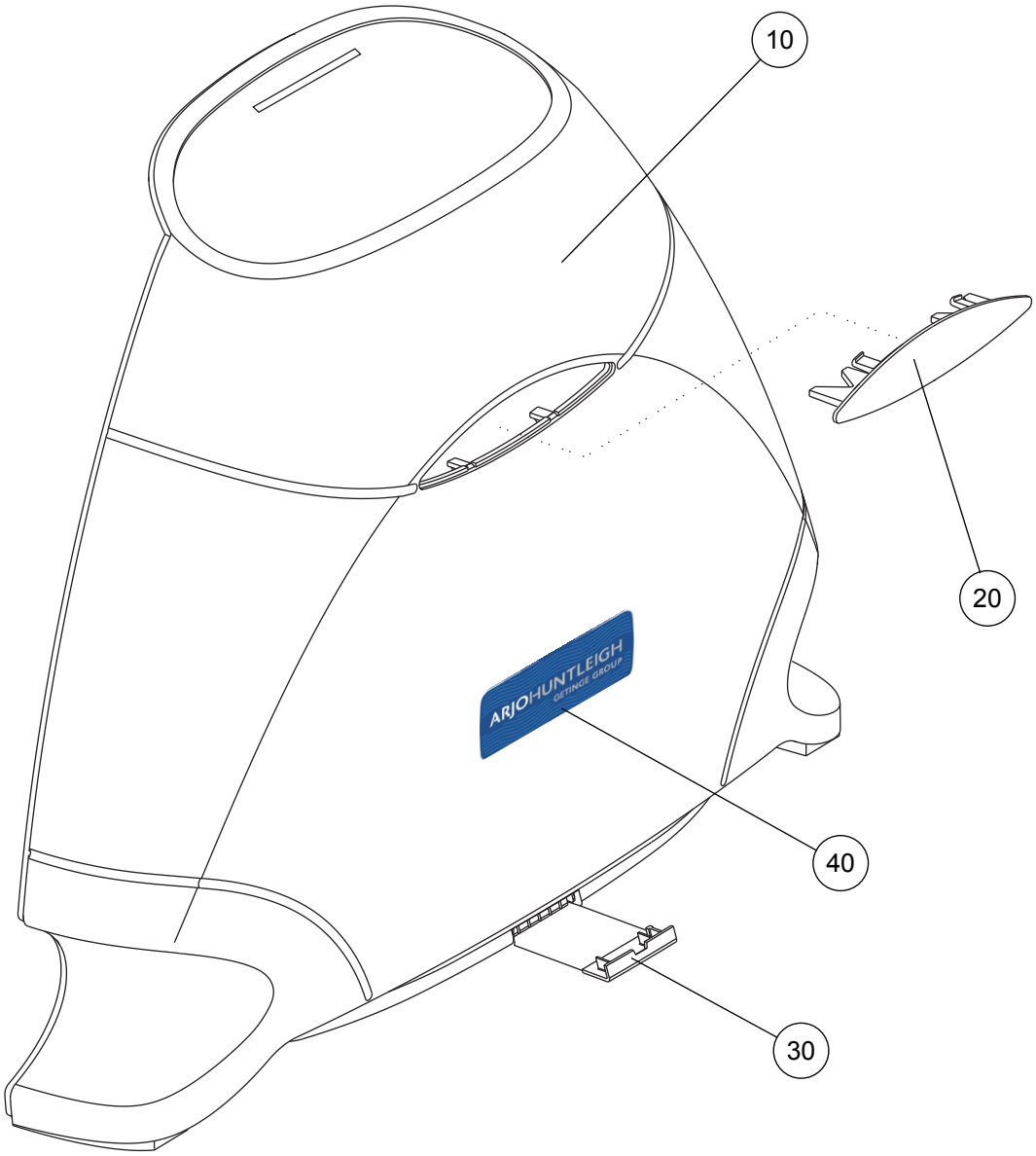


Figure 67 - New Style Front Case - LED Lens, Pump Label and Battery Socket Cover

Table 30 - New Style Front Case - External Components

Item	Part Number	Description	Qty
10	630570	Front Case (Moulding only) - new style	1
20	630324	IrDA LED Lens	1
30	630319	Battery Socket Cover	1
40	PKG830	Gel Pad Label	1

36.7 Turn the front case over so that the outside surface is pointing upwards.

36.8 Install the following components onto the outside of the front case:

36.8.1 The IrDA LED lens (Fig 67, Item 20). Push the lens until it clicks securely into place.

Note: *The IrDA LED lens is asymmetric and can only be installed one way.*

36.8.2 A new self-adhesive **ArjoHuntleigh** gel pad label (Fig 67, Item 40). Centralise the label in the case recess.

36.9 Install the following components into the front case:

36.9.1 Install the four PCB mounting pillars (Fig 68, Item 40) and four screws (Fig 68, Item 30) into the front case.

36.9.2 The control PCB assembly:

36.9.2.1 Make sure the transducer tube is pushed fully onto the top outlet on the transducer on the control PCB assembly (Refer to Figure 68).

CAUTION: Do not handle the transducer on the control PCB assembly unnecessarily. The transducer is a sensitive device. To avoid damage, put your finger at the back of the transducer while you push the tube onto the top outlet at the front of the transducer.

36.9.2.2 Put the control PCB assembly (Fig 68, Item 10) into the front case, over the PCB mounting pillars (Fig 68, Item 40), and install the four screws (Fig 68, Item 20) to secure it to the front case.

36.9.3 The membrane label:

36.9.3.1 Before you remove the protective sheet from the back of the new membrane label, check the following:

- The correct orientation of the membrane label on the top of the pump (Refer to Figure 69).

36.9.3.2 Remove the protective sheet from the back of the membrane label.

36.9.3.3 Pass the membrane cable through the slot in the case.

36.9.3.4 Carefully push the membrane cable into the membrane connector on the control PCB assembly (Fig 69, PCB Con 15).

36.9.4 The power supply PCB assembly, together with the external battery connector (Refer to Page 99, Section 23).

WARNING: DO NOT CONNECT THE MAINS/POWER CORDSET TO THE POWER SUPPLY PCB ASSEMBLY, AND SWITCH ON THE MAINS/POWER SUPPLY, WHEN THE REAR CASE IS REMOVED FROM THE PUMP. VOLTAGES IN EXCESS OF 230 VOLTS RMS / 400 VOLTS DC ARE PRESENT ON THE POWER SUPPLY PCB ASSEMBLY AND CAN, IN CERTAIN CIRCUMSTANCES, BE LETHAL.

36.9.4.1 Connect the ribbon cable connector (Refer to Figures 42 and 53) from the control PCB assembly onto the top of the power supply PCB assembly (Fig 53, Item 10).

36.9.4.2 Make sure the connector sealing strip is still stuck to the back of the battery pack connector (Refer to Refer to Page 98, Figure 53).

36.9.4.3 Make sure there is a second connector sealing strip (Fig 53, Item 40) stuck to the front case, adjacent to the battery pack connector slot (Refer to Figure 53).

36.9.4.4 Insert the battery pack connector into the slot in the front case, and install the two screws (Fig 53, Item 20) to secure it.

Note: *Make sure the wires from the power supply PCB assembly to the battery pack connector do not lie on top of the circular compressor support rubbers (Refer to Figure 53).*

36.9.5 Stick a new connector sealing strip (Fig 66, Item 70) to the front case, adjacent to the battery pack connector.

36.9.6 The compressor assembly and mounting bracket (Refer to Page 93, Section 18).

36.9.7 The manifold assembly (Refer to Page 85, Section 12).

36.9.8 A battery socket cover (Fig 67, Item 30).

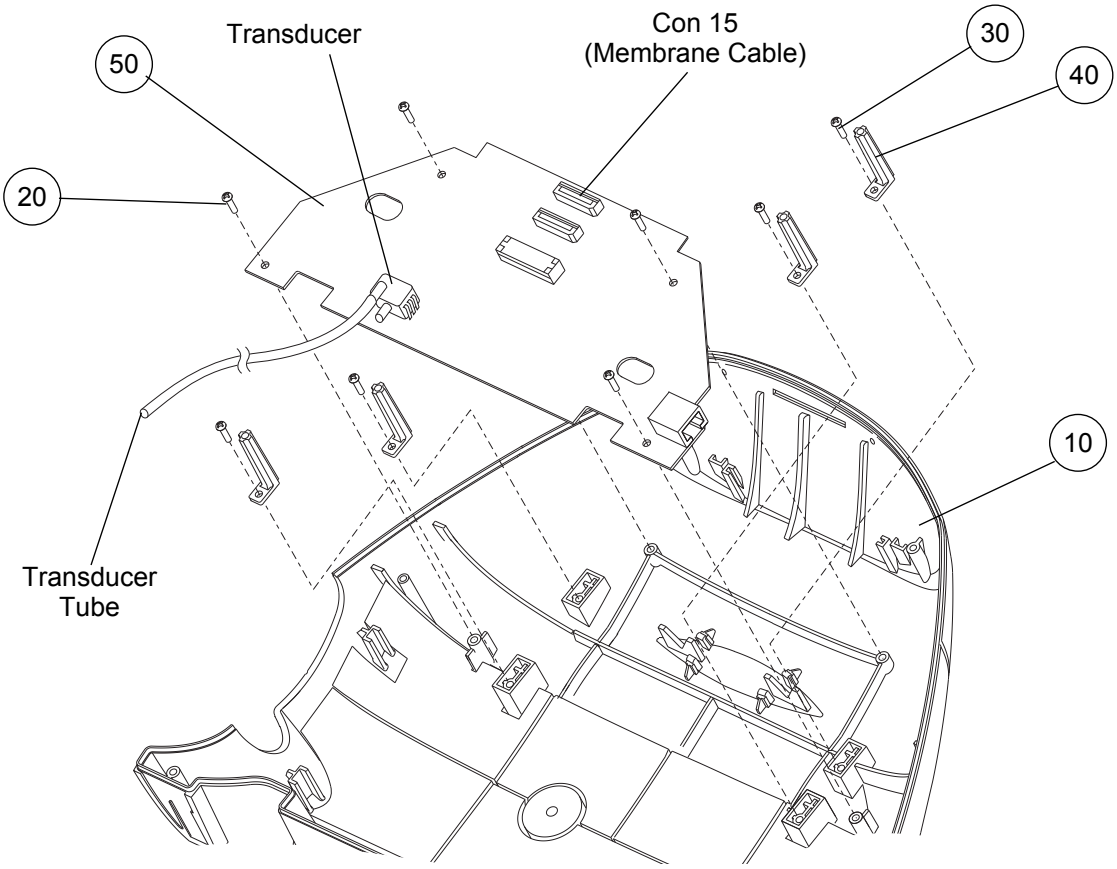


Figure 68 - Replacing the Control PCB Assembly and Mounting Pillars

Table 31 - Control PCB Assembly and Mounting Pillars

Item	Part Number	Description	Qty
10	630570	Front Case (Moulding only) - new style	1
20	FAS145	Screw, 3 dia x 8 Pan Head	4
30	FAS223	Screw, 3 dia x 10 Pan Head	4
40	630318	PCB Mounting Pillar	4
50	630400 630140 654140	Control PCB (superseded by 630140, from serial number 0900058473 onwards) Control PCB Control PCB (Autofirm model only)	1

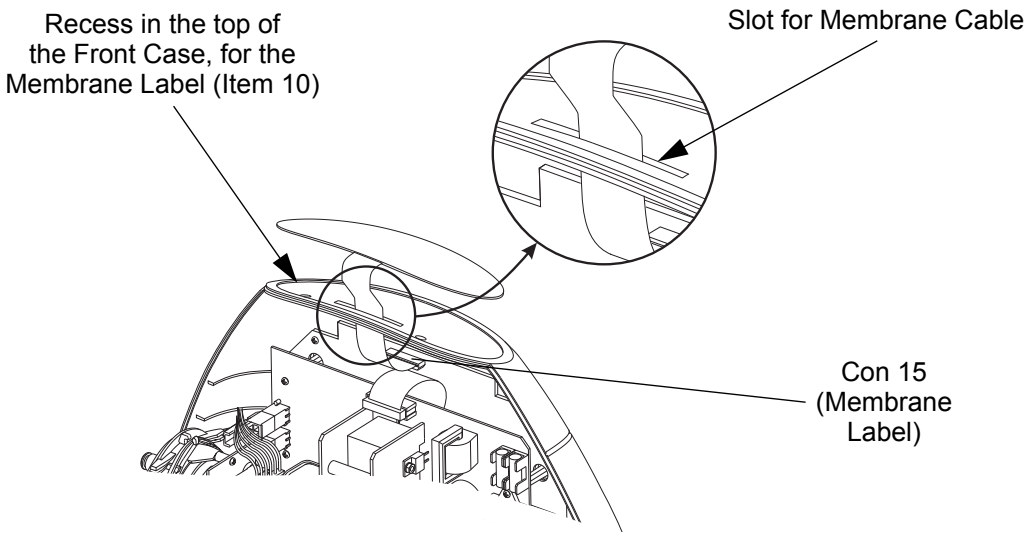


Figure 69 - Membrane Label Fitment

36.10 Remove the hooks and hook covers from the rear case (Refer to Page 83, Section 9).

36.11 Remove the air inlet filter from the rear case (refer to Page 79, "Removing the Air Inlet Filter").

36.12 Remove the handle insert from the rear case:

36.12.1 Depress the retaining clips within the case and pull the handle away from the rear case.

36.13 Remove the serial number and product labels from the rear case (Refer to Page 104, Section 29).

36.14 Discard the old rear case (Fig 60, Item 10).

36.15 Lay the new rear case (Fig 70, Item 10) down with the outside surface pointing upwards.

36.16 Install the following components onto the rear case:

36.16.1 Handle insert from the old rear case (Fig 70, Item 30).

36.16.2 Six new rubber feet (Fig 70, Item 20).

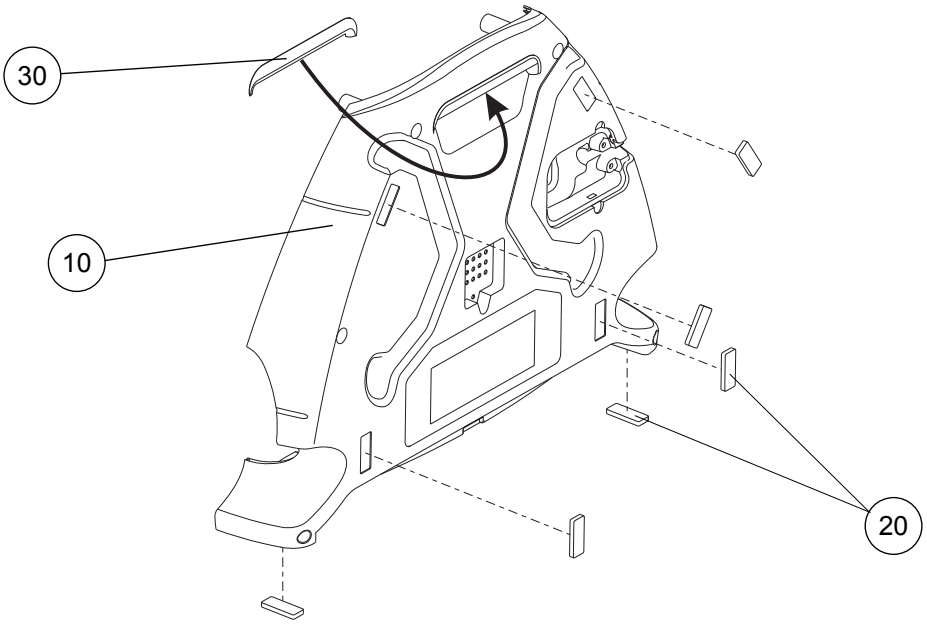


Figure 70 - Rear Case - Handle Insert and Rubber Feet

36.17 Turn the rear case over so that the inside surface is pointing upwards.

36.18 Remove the backing strips, and install the following components onto the rear case:

36.18.1 New noise-reduction foam (Fig 71, Item 40).

Note: *Make sure that the noise-reduction foam is accurately located in the recesses in the rear case, between the strengthening ribs.*

36.18.2 Two new compressor support rubbers (Fig 71, Item 50).

36.19 Install the hooks and hook covers onto the rear case (Refer to Page 83, Section 10).

36.20 Install the rear case onto the front case (Refer to Page 81, Section 8).

36.21 Install the air inlet filter onto the rear case (Refer to Page 79, Section 6).

36.22 Install the mains/power cordset onto the pump (Refer to Page 79, Section 4).

36.23 Stick the serial number and product labels onto the rear case (Refer to Page 104, Section 29).

36.24 Install the mains/power cordset onto the pump (Refer to Page 79, Section 4).

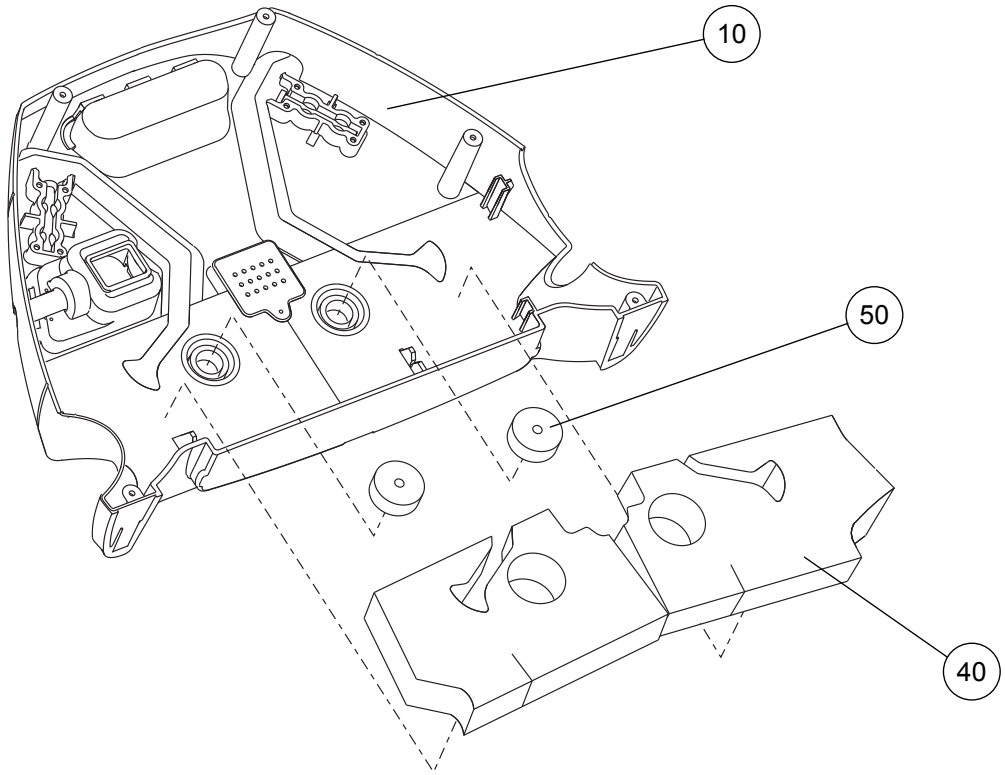


Figure 71 - Rear Case - Noise-Reduction Foam and Compressor Support Rubbers

Table 32 - Rear Case Components

Item	Part Number	Description	Qty
10	630571	Rear Case (Moulding only) - new style	1
20	507413	Rubber Foot	6
30	630330	Handle Insert	1
40	630383	Noise-Reduction Foam, Rear Case	1
50	BP027	Compressor Support Rubber	2

37 Mains Cable Information

Table 33 - Mains Cable Matrix

Cable Part Number/ Description / Pump Model Number	*630415 CORDSET UK 6M Coiled*	*630417 UL/CSA 3 CORE 6M Coiled*	*630416 EURO SCHUKO PLUG 6M Coiled*	*630515 CORDSET AUS 6M Coiled*	*CAB301** SHORT MALE IEC TO FEM IEC (Fitted To Pump)*	*CAB312 CHINA IEC STRAIGHT COILED CABLE*	*CAB310 JAPAN IEC STRAIGHT COILED CABLE*	*CAB311 STH AFRICAN/INDIAN IEC STR COILED CABLE*
630001	■							
630003		■						
630004BE			■					
630004DE			■					
630004DK			■					
630004ES			■					
630004FR			■					
630004IT			■					
630004NL			■					
630004SV			■					
630004AU				■				
630EUR			■					
630UNI (2 Part Lead)					■	■		
630UNI (2 Part Lead)					■		■	
630UNI (2 Part Lead)					■			■

Note: *Item marked ** (CAB301) is the short male to female IEC lead fitted to Chinese, Japanese, Indian & South African 630UNI pumps only along with the relevant country specific mains lead (CAB310 South African/Indian, CAB311 Japanese and CAB312 Chinese).*

CHAPTER 6

MATTRESS REPAIR

1 General

This chapter details repair procedures for the **Auto Logic** mattresses.

There are three series of **Auto Logic** mattresses. All feature a Top Cover and Mattress Core (with static and alternating cells). A base pad and base cover may be fitted below the mattress core, depending on the mattress series. The differentiating features are:

- **Auto Logic** 110 has NO base pad and NO base cover, available in standard and narrow widths
- **Auto Logic** 175 has a foam base pad and base cover, available in standard width only
- **Auto Logic** 200 has a static inflatable base pad and base cover, available in standard and narrow widths

Refer to Chapter 11 “Parts List” for all variants and part numbers.

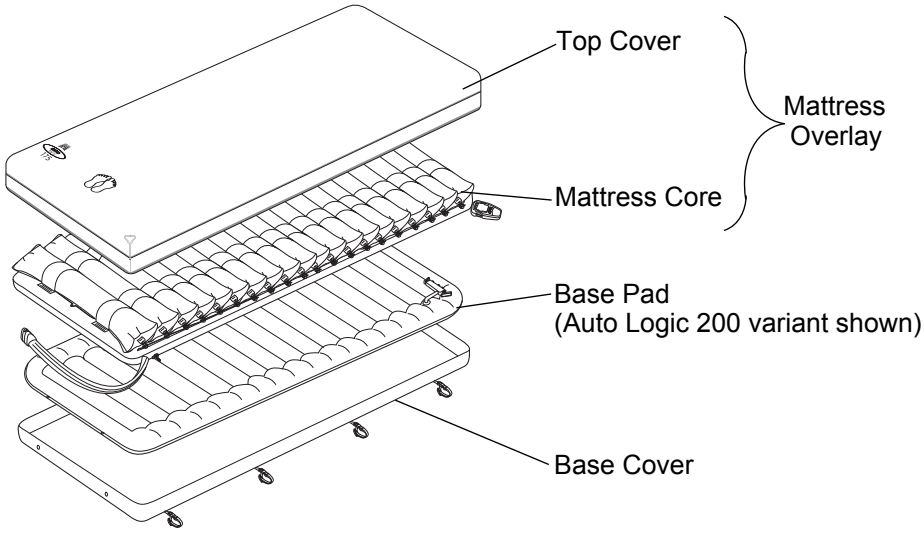


Figure 72 - Auto Logic mattress main components

In this chapter, headings 2-22 relate to the mattress overlay, headings 23-30 relate to the base pad. Heading 31 (Press Stud Replacement) relates to all components, as required.

Repairs should be carried out only by ArjoHuntleigh approved service personnel. To carry out the repair procedures, fully deflate the mattress as follows:

- Disconnect the tubeset between the mattress and the pump.
- Operate the CPR (Cardio-Pulmonary Resuscitation) unit to deflate the mattress.
- For Mattress Base Pad service: First separate the Mattress Overlay from the Base Pad (Refer to Page 115, Section 11).
- For Mattress Overlay/Core service: It is easier to carry out the repair procedures to the Overlay/Core if it is first separated from the base pad (Refer to Page 138, Section 12). It is however not necessary to separate them unless the particular repair procedure specifies it.

After carrying out a service or any repairs, the mattress must be tested for serviceability. Carry out an inflation test on the mattress in accordance with Chapter 4 “Testing”, Page 75, Section 20.

2 Removing the Top Cover Assembly

Three different material top cover assemblies are available for **Auto Logic 110**, **175** and **200**:

- Dartex. This is the standard top cover assembly.
- Advantex®.
- eVENT® [1].

The three top cover assemblies for the **Auto Logic 110** mattress overlay are similar to the three top cover assemblies for the **Auto Logic 175 and 200** mattress replacements (Refer to Table 34 to Table 38). The only difference is the product logo at the foot end of the mattress.

2.1 Undo the two long zips which secure the top cover assembly (refer to Table 34 through Table 38, Item 10) to the base sheet assembly.

2.2 Remove the top cover assembly from the mattress.

3 Installing the Top Cover Assembly

The three top cover assemblies for the **Auto Logic 110** mattress overlay are similar to the three top cover assemblies for the **Auto Logic 175 and 200** mattress replacements (Refer to Table 34 to Table 38 for further top cover information). The only difference is the product logo at the foot end of the mattress.

Note: *Make sure that the top cover assembly with the correct product logo is installed on the mattress.*

3.1 Before installing the top cover, check that the ends of the cell assemblies are correctly connected to the sides of the base sheet assembly and the cell assemblies are evenly distributed in the loops on the base sheet assembly. Any repairs will normally have disturbed the position of the cells.

3.2 Position the top cover assembly (refer to Table 34 through Table 38, Item 10) over the mattress, with the feet logo uppermost at the foot end of the bed.

3.3 Starting at the head end of the mattress, fasten the two long zips to secure the top cover assembly to the base sheet assembly.

Table 34 - Auto Logic 110 Top Cover Assembly Parts List

Item	Part Number	Description	Qty
REF	PXA080	Top Cover Assembly, **Auto Logic 110** Mattress Overlay, Dartex (Standard)	1
REF	PXA082	Top Cover Assembly, **Auto Logic 110** Mattress Overlay, Advantex	1
REF	PXA084	Top Cover Assembly, **Auto Logic 110** Mattress Overlay, eVENT	1

1. *eVENT® is a registered trademark of BHA Technologies Inc.*

Table 35 - Auto Logic 110 Narrow Width Top Cover Assembly Parts List

Item	Part Number	Description	Qty
REF	PXA280	Top Cover Assembly, **Auto Logic 110** Mattress Replacement, Dartex (Standard) - Narrow Width	1
REF	PXA282	Top Cover Assembly, **Auto Logic 110** Mattress Replacement, Advantex - Narrow Width	1
REF	PXA284	Top Cover Assembly, **Auto Logic 110** Mattress Replacement, eVENT - Narrow Width	1

Table 36 - Auto Logic 175 Top Cover Assembly Parts List

Item	Part Number	Description	Qty
REF	PXB180	Top Cover Assembly, **Auto Logic 175** Mattress Replacement, Dartex (Standard)	1
REF	PXB182	Top Cover Assembly, **Auto Logic 175** Mattress Replacement, Advantex	1
REF	PXB184	Top Cover Assembly, **Auto Logic 175** Mattress Replacement, eVENT	1

Table 37 - Auto Logic 200 Top Cover Assembly Parts List

Item	Part Number	Description	Qty
REF	PXB080	Top Cover Assembly, **Auto Logic 200** Mattress Replacement, Dartex (Standard Material)	1
REF	PXB082	Top Cover Assembly, **Auto Logic 200** Mattress Replacement, Advantex	1
REF	PXB084	Top Cover Assembly, **Auto Logic 200** Mattress Replacement, eVENT	1

Table 38 - Auto Logic 200 Narrow Width Top Cover Assembly Parts List

Item	Part Number	Description	Qty
REF	PXB280	Top Cover Assembly, **Auto Logic 200** Mattress Replacement, Dartex (Standard Material) - Narrow Width	1
REF	PXB282	Top Cover Assembly, **Auto Logic 200** Mattress Replacement, Advantex - Narrow Width	1
REF	PXB284	Top Cover Assembly, **Auto Logic 200** Mattress Replacement, eVENT - Narrow Width	1

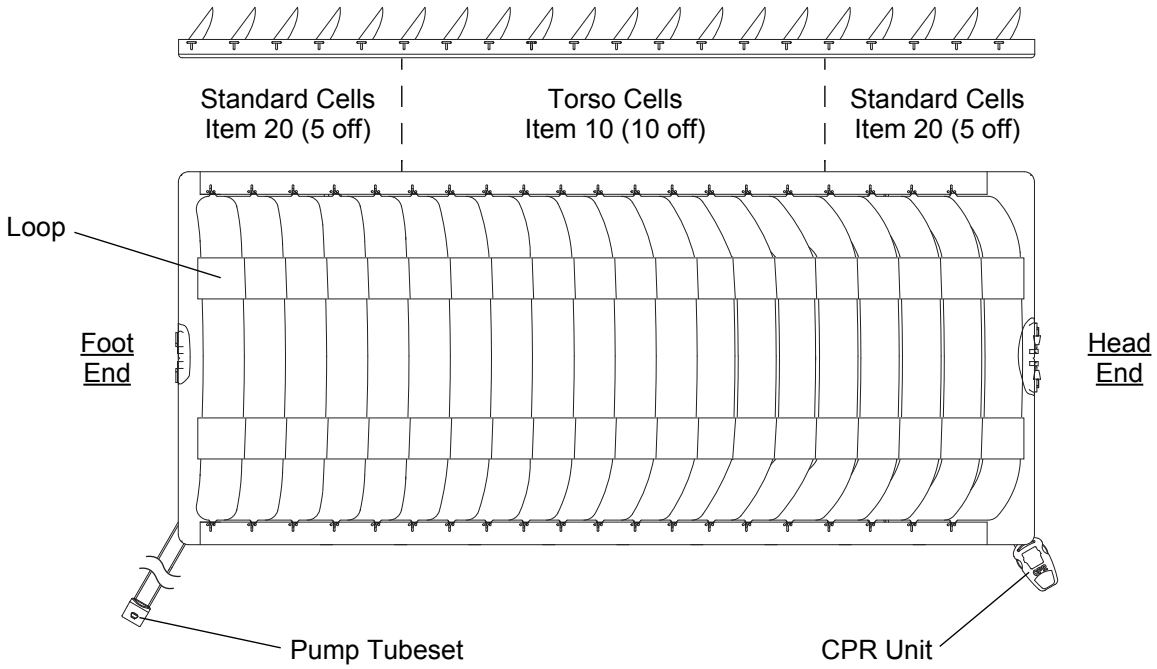


Figure 73 - Cell Arrangement

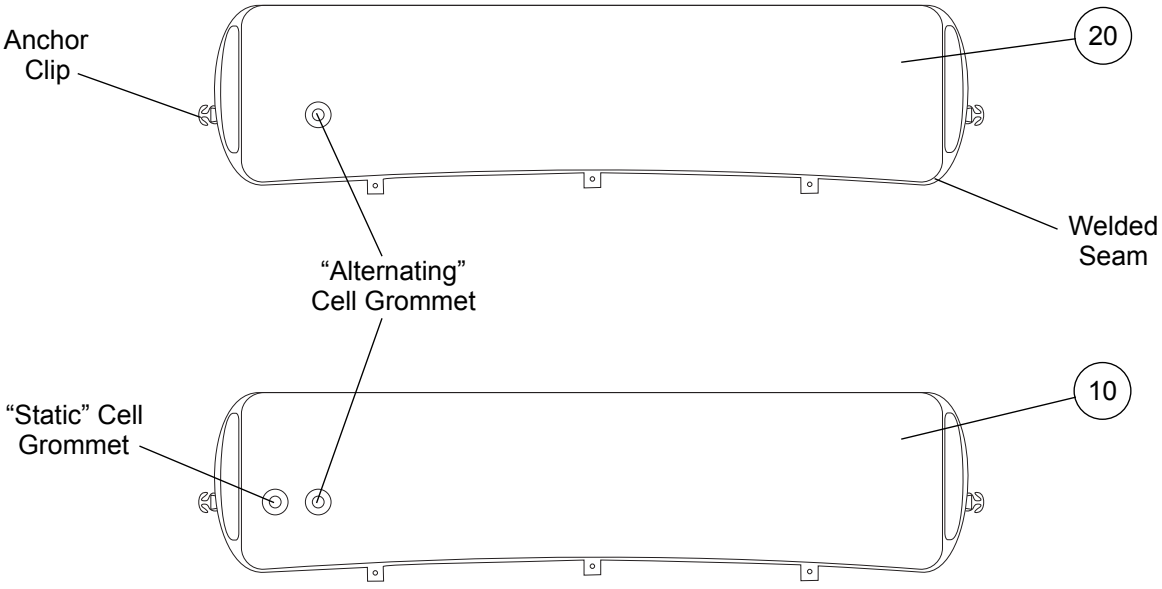


Figure 74 - Mattress Cell Orientation

Table 39 - Top Cover and Mattress Cell Parts List

Item	Part Number	Description	Qty
10	PXA050	Cell Assembly, Torso (Cell-in-Cell), Light Blue	10
	PXA250	Cell Assembly, Torso (Cell-in-Cell), Light Blue Narrow	
20	PXA060	Cell Assembly, Standard, Dark Blue	10
	PXA260	Cell Assembly, Standard, Dark Blue Narrow	

4 Removing a Cell Assembly

4.1 Remove the top cover (Refer to Page 124, Section 2).

4.2 At both ends of the cell assembly (Fig 75, Items 10 or 20), remove the anchor clip from the base sheet assembly as follows (Refer to Figure 75):

4.2.1 Step 1: Pull the end of the anchor clip outwards, and away from the base sheet assembly.

4.2.2 Step 2: Rotate the anchor clip though approximately 90° clockwise or counterclockwise.

4.2.3 Step 3: Pull the anchor clip through the base sheet assembly towards the centre of the mattress.

4.3 At the manifold end of the cell assembly, disconnect the cell feed(s) from the T-connector(s) on the manifold tube assembly, as follows.

Note: *The 10 off torso cell assemblies (Fig 75, Item 10) in the centre of the mattress have two cell feeds. The 10 off standard cell assemblies (Fig 75, Item 20) at either end of the mattress have only one cell feed.*

4.3.1 Hold the manifold tube assembly with one hand.

4.3.2 Grip the end of the cell with the other hand.

4.3.3 Give a quick, firm pull to remove the T-connector on the manifold tube assembly from the cell grommet on the cell assembly.

4.3.4 If necessary, repeat to disconnect the other cell feed.

4.4 Remove the cell assembly from the loops in the base sheet assembly.

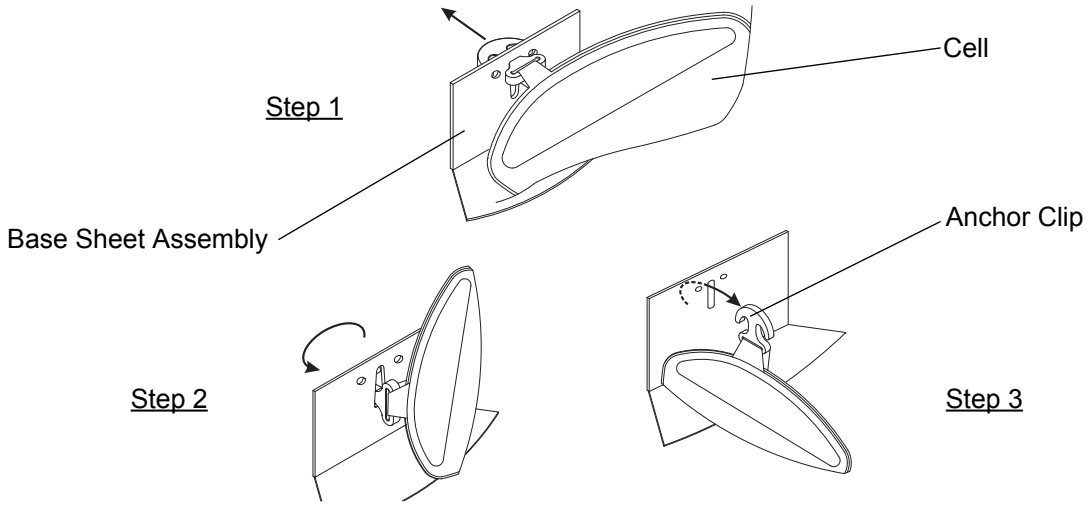


Figure 75 - Cell Removal From Base Sheet Assembly

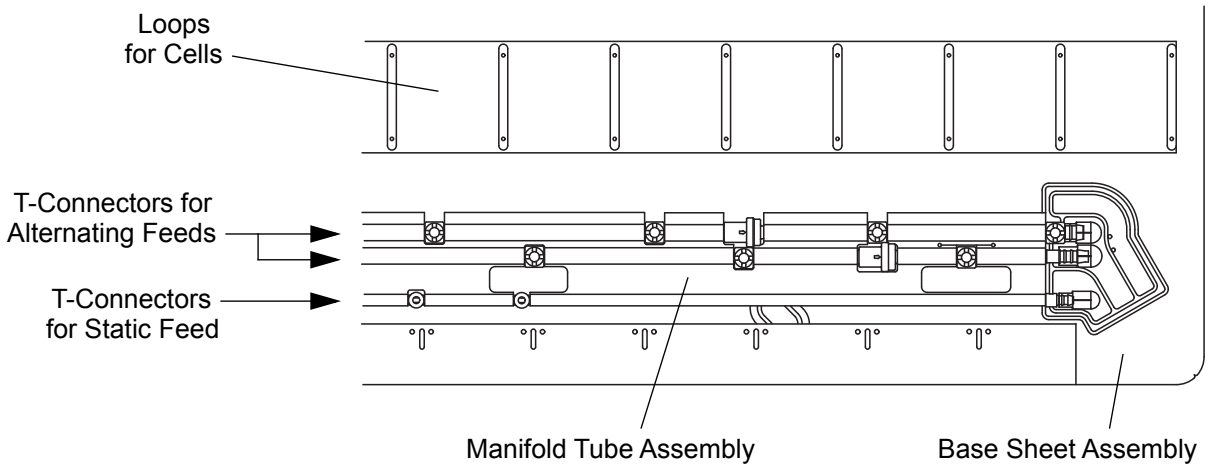


Figure 76 - Installing the Cell Assembly to the Manifold Tube Assembly

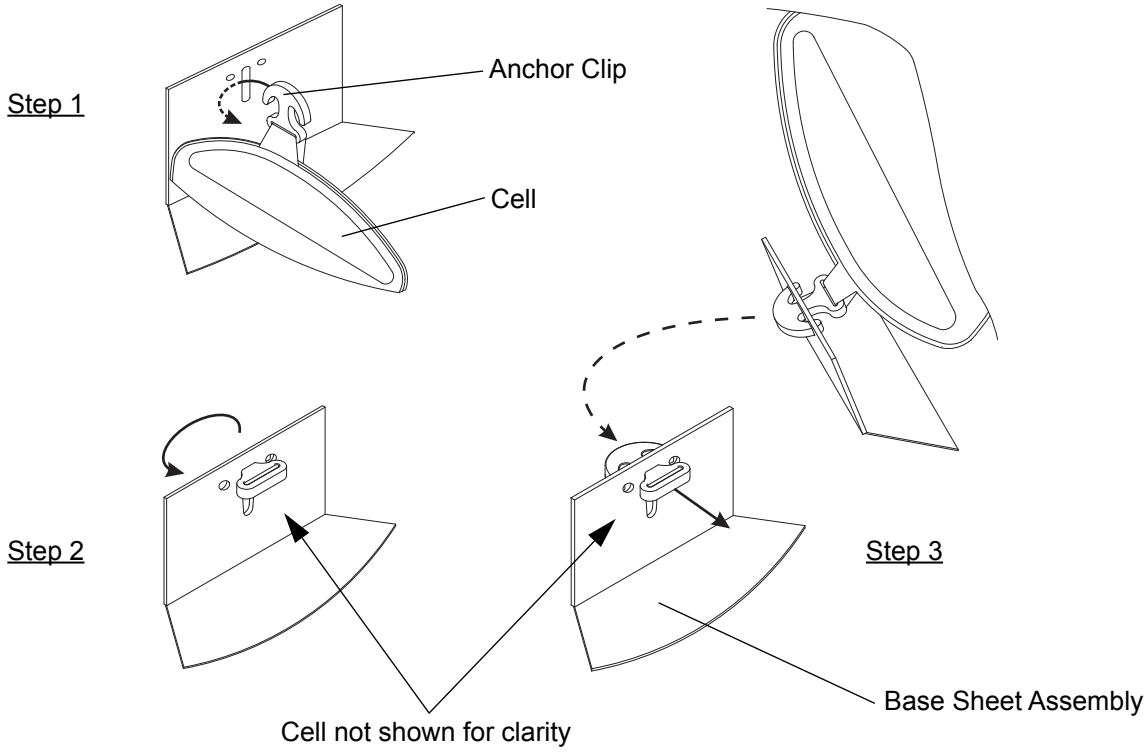


Figure 77 - Orientation of Partial Non-Return Valves

5 Installing a Cell Assembly

Note: *There are two different types of cell in the mattress (Refer to Figures 73 and 74). The 10 off torso cell assemblies (Fig 75, Item 10) in the centre of the mattress have two cell feeds, and are light blue. The 10 off standard cell assemblies (Fig 75, Item 20) at either end of the mattress have only one cell feed, and are dark blue. Make sure that the cell is the correct type for its position in the mattress.*

5.1 Feed the cell through the loops in the base sheet assembly, with the cell feed(s) adjacent to the manifold tube assembly.

Note: *Make sure the longitudinal welded seam is at the bottom of the cell assembly, facing towards the foot end of the mattress. Position the welded seam under the adjacent cell (Refer to Figures 73 and 74).*

5.2 Connect the cell feed(s) to the manifold tube assembly, as follows (Refer to Figure 76).

All 20 cell assemblies have a cell feed to one of the two alternating feeds in the manifold tube assembly. Adjacent cell assemblies are connected to opposite alternating feeds e.g. Cell 1 is connected to alternating feed “A”, Cell 2 is connected to alternating feed “B”, Cell 3 is connected to alternating feed “A”, and so on. The 10 torso cell assemblies have a second cell feed which is connected to the static feed on the manifold tube assembly (Refer to Figures 74 and 76).

Note: *Installing the cell feeds is made easier if the cell grommet and/or T-connector is wetted with methylated spirit immediately prior to insertion.*

5.2.1 Push the T-connector on the relevant alternating feed on the manifold tube assembly into the “alternating” cell grommet on the cell assembly.

Note: *On torso cells, the “alternating” cell grommet is nearest the centre of the cell (Refer to Figure 74).*

5.2.2 On torso cells, push the T-connector on the static feed on the manifold tube assembly into the “static” cell grommet on the cell assembly.

Note: *The “static” cell grommet is nearest the end of the cell (Refer to Figure 74).*

5.3 At each end of the cell assembly (Fig 75, Items 10 or 20), install the anchor clip onto the base sheet assembly as follows (Refer to Figure 75):

5.3.1 Step 1: Push the anchor clip through the base sheet assembly from the centre of the mattress towards the outside.

5.3.2 Step 2: Rotate the anchor clip though approximately 90° so that the two pointed ends of the anchor clip are aligned with the two holes in the base sheet assembly

Note: *Rotate the anchor clip either clockwise or counterclockwise depending on the side of the mattress, so that there are no twists in the cell assembly or the anchor clip fixing strap.*

5.3.3 Step 3: Secure the anchor clip, by pulling it in towards the centre of the mattress, so that the two pointed ends of the anchor clip pass through the two holes in the base sheet assembly.

5.4 Install the top cover (Refer to Page 124, Section 3).

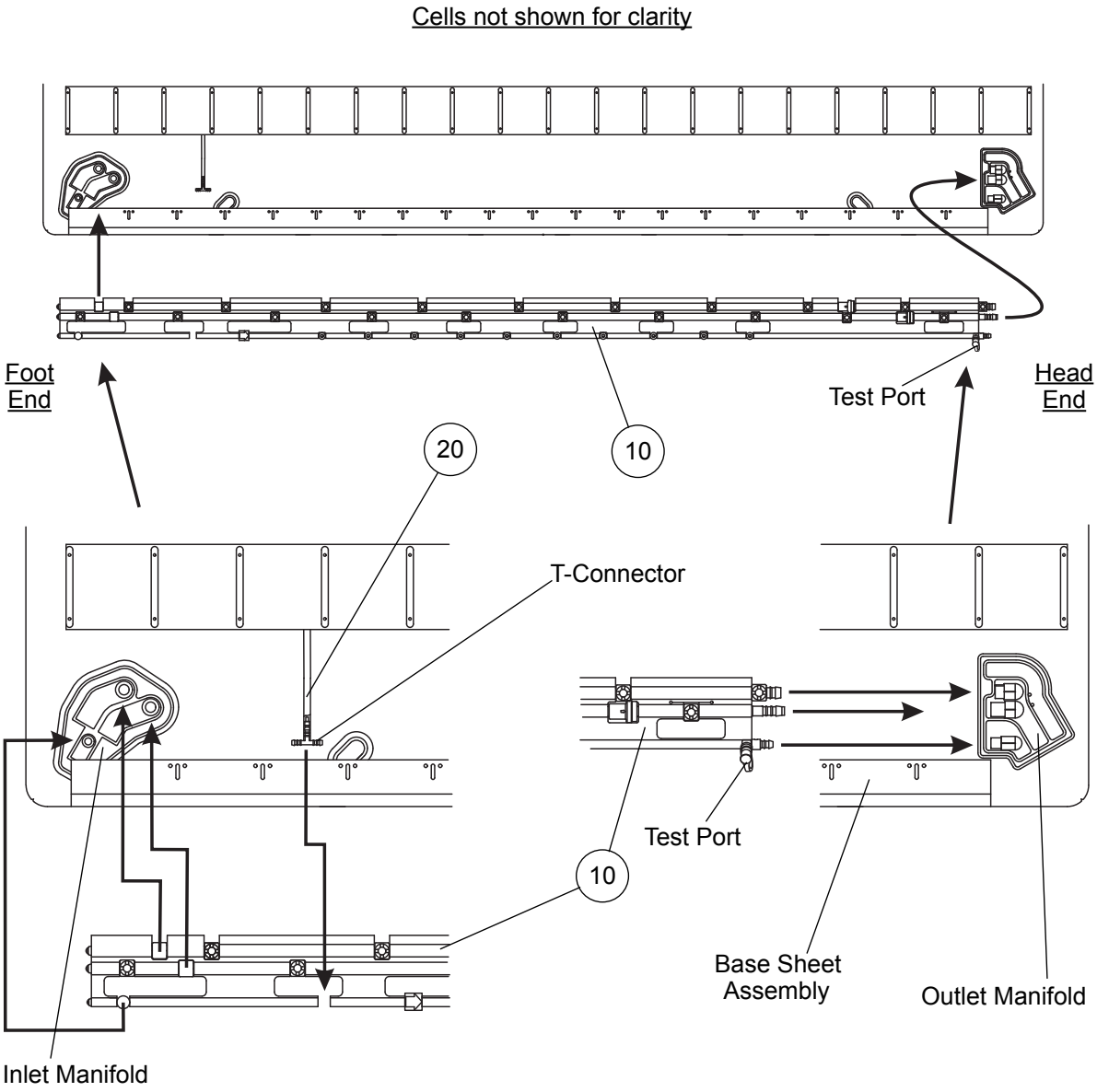


Figure 78 - Replacing the Manifold Tube Assembly
(Manifolds manufactured before July 2004 will not feature the Test Port)

Table 40 - Manifold Tube Assembly Parts List

Item	Part Number	Description	Qty
10	PXA090	Manifold Tube Assembly	1
20	PXA059	Tube Assembly, Low Air Loss Patch	1

6 Removing the Manifold Tube Assembly

6.1 Remove the top cover (Refer to Page 124, Section 2).

6.2 On all 20 cell assemblies, remove the anchor clip from the base sheet assembly at the manifold tube assembly end ***ONLY***, as detailed in Para 4.2 (Refer to Page 127, Section 4).

6.3 On all 20 cell assemblies, disconnect the cell feed(s) from the T-connector(s) on the manifold tube assembly, as detailed in Para 4.3 (Refer to Page 127, Section 4).

6.4 Disconnect the low-air-loss (LAL) patch tube assembly (Fig 78, Item 20) from the manifold tube assembly (Fig 78, Item 10), by carefully removing both sides of the T-connector on the end of the LAL patch tube assembly from the tubes in the manifold tube assembly.

Note: *The T-connector is part of the tube assembly to the LAL patch, and not part of the manifold tube assembly.*

6.5 Disconnect the manifold tube assembly from the outlet manifold at the head end of the mattress, by pulling the three male connectors at the end of the manifold tube assembly horizontally out of the outlet manifold on the base sheet assembly.

Note: *The connectors are part of the manifold tube assembly and not part of the outlet manifold.*

6.6 Disconnect the manifold tube assembly from the inlet manifold at the foot end of the mattress, by pulling the three T-connectors at the end of the manifold tube assembly vertically out of the inlet manifold on the base sheet assembly.

Note: *The connectors are part of the manifold tube assembly and not part of the inlet manifold.*

6.7 Remove the manifold tube assembly (Fig 78, Item 10).

7 Installing the Manifold Tube Assembly

The manifold tube assembly (Fig 78, Item 10) comprises all the T-connectors to the 20 cell assemblies, and the three non-return valves. It does not include the T-connector on the LAL patch tube assembly.

7.1 Position the manifold tube assembly on top of the base sheet assembly, as shown in Figure 78.

Note: *Installing the manifold tube assembly is made easier if the connectors are wetted with methylated spirit immediately prior to insertion.*

7.2 Connect the manifold tube assembly to the inlet manifold at the foot end of the mattress, by pushing the three T-connectors at the end of the manifold tube assembly vertically into the inlet manifold on the base sheet assembly.

7.3 Connect the manifold tube assembly to the outlet manifold at the head end of the mattress, by pushing the three male connectors at the end of the manifold tube assembly horizontally into the outlet manifold on the base sheet assembly.

7.4 Connect the LAL patch tube assembly (Fig 78, Item 20) to the manifold tube assembly (Fig 78, Item 10), by carefully inserting both sides of the T-connector on the end of the LAL patch tube assembly into the tubes in the manifold tube assembly.

7.5 On all 20 cell assemblies, re-connect the cell feed(s) onto the T-connector(s) on the manifold tube assembly, as detailed in Para 5.2 (Refer to Page 129, Section 5).

7.6 On all 20 cell assemblies, install the anchor clip onto the base sheet assembly at the manifold tube assembly end, as detailed in Para 5.3 (Refer to Page 129, Section 5).

7.7 Ensure the Test Port located next to the outlet manifold (Figure 78) is in the closed position.

7.8 Install the top cover (Refer to Page 124, Section 2).

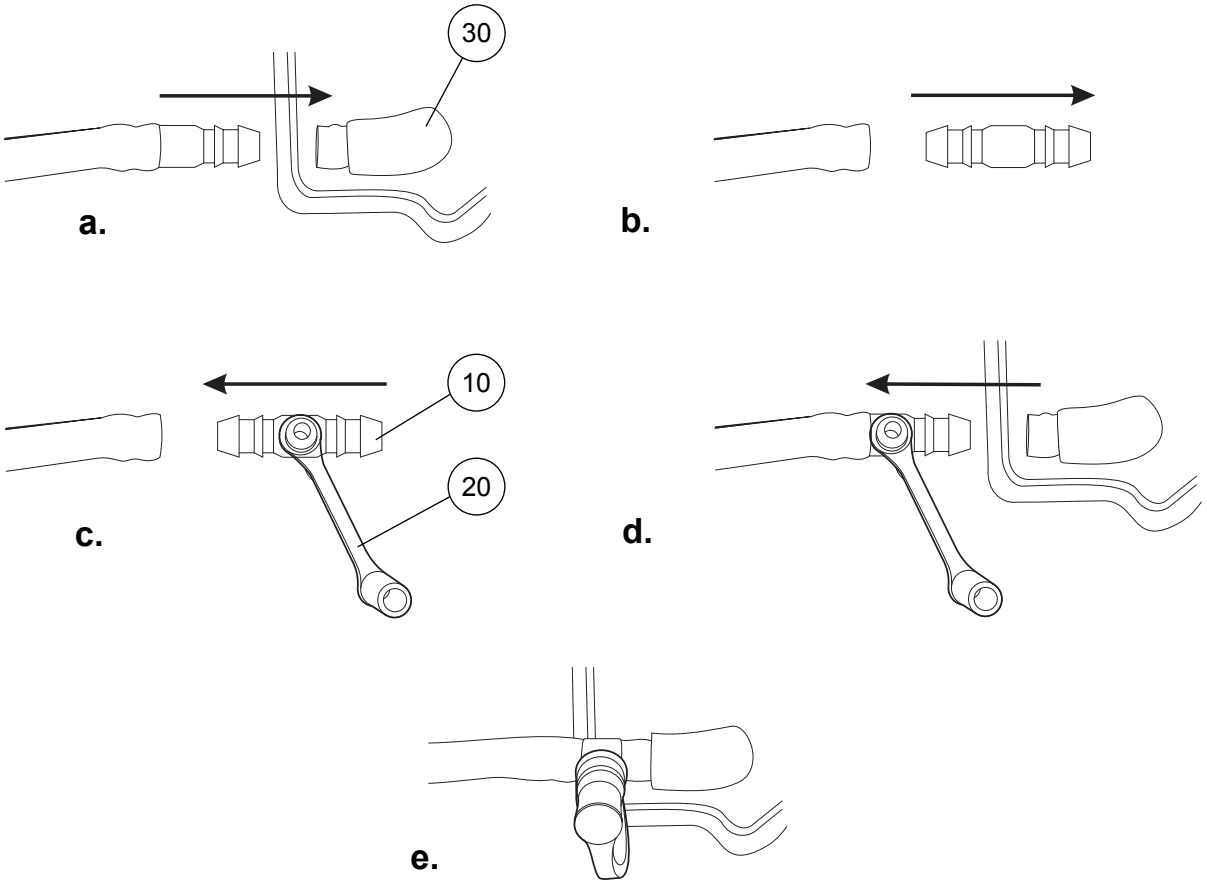


Figure 79 - Test Port Fitment

Table 41 - Test Port Parts List

Item	Part Number	Description	Qty
-	PXA077	Test Port Assembly (Items 10 and 20)	1
10	401300	T-Connector	1
20	CAS077	Stopper	1
30	-	Outlet Manifold Grommet	-

8 Replacing/Fitting Test Port Assembly To Static Cell-in-Cell Line

Note: *Follow this procedure to replace the straight connector with a T-connector, or to replace a defective Test Port Assembly.*

The addition of the test port into the Cell-In-Cell static line is to allow the measurement of pressure in the inner cells and the periphery of the B Pad. This static portion of the mattress is created by the red non-return valve which is located near the foot end of the manifold, therefore the test port has to be positioned on the static side of the valve. The Test Port Assembly is comprised of a T-connector and a Stopper.

Remove the mattress top cover and follow the steps shown in Figure 79.

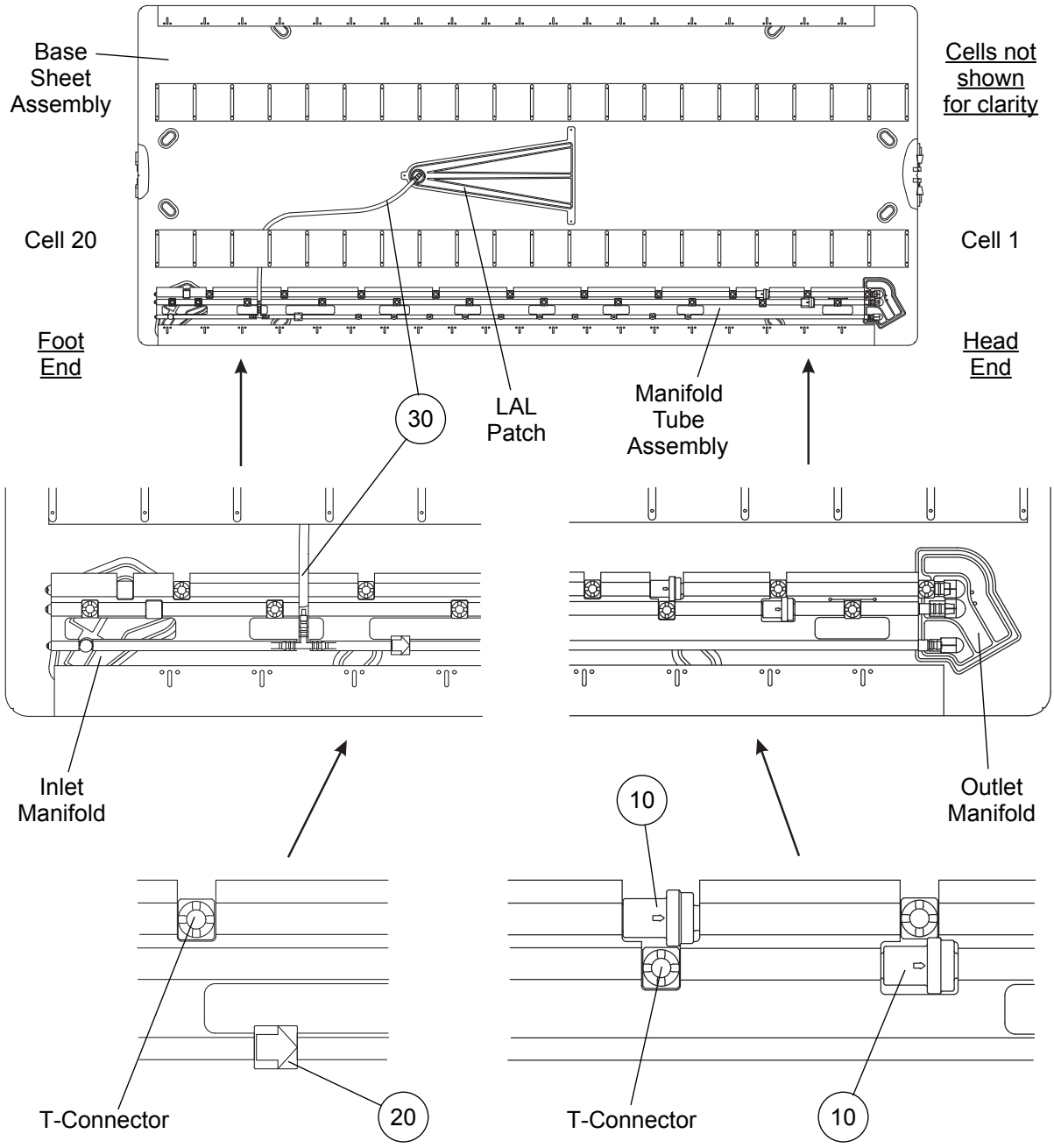
a. At the foot of the mattress, pull the static line tubing from the Outlet Manifold Grommet.

b. Remove the straight connector (or defective Test Port Assembly).

c. Fit the new Test Port Assembly to the static line tubing.

d. Connect the Test Port Assembly and tubing to the Outlet Manifold Grommet.

e. Ensure the Test Port Assembly is in the closed position (Stopper inserted into T-connector).



Note the orientation of the three Non-Return Valves (Items 10 and 20): the arrow on the Non-Return Valves always points to the head end of the mattress.

Figure 80 - Replacement of the Non-Return Valves and the LAL Patch Tube Assembly

Table 42 - Non-Return Valves and the LAL Patch Tube Assembly Parts List

Item	Part Number	Description	Qty
10	PXA335	Partial Non-Return Valve Assembly	2
20	627389	Non-Return Valve	1
30	PXA059	Tube Assembly, Low-Air-Loss (LAL) Patch	1

9 Replacing the Non-Return Valves

9.1 There are two partial non-return valve assemblies (Fig 80, Item 10) at the head end of the mattress, and a single non-return valve (Fig 80, Item 20) at the foot end of the mattress:

9.1.1 To replace a partial non-return valve assembly at the head end of the mattress, carry out the procedure starting at Para 9.2.

9.1.2 To replace the non-return valve at the foot end of the mattress, carry out the procedure starting at Para 9.8.

Replacing the Partial Non-Return Valve Assembly at the Head End of the Mattress

9.2 Remove the top cover (Refer to Page 124, Section 2).

9.3 On cell assemblies 1 to 5 only (at the head end of the mattress), remove the anchor clip from the base sheet assembly at the manifold tube assembly end ***ONLY***, as detailed in Para 4.2 (Refer to Page 127, Section 4).

Note: *Cell 1 is at the head end of the mattress, and cell 20 is at the foot end.*

9.4 Carefully remove both ends of the partial non-return valve assembly (Fig 80, Item 10) from the manifold tube assembly.

9.5 Push the ends of the new partial non-return valve assembly (Fig 80, Item 10) into the manifold tube assembly.

CAUTION: Make sure that the arrow mark on the partial non-return valve assembly points towards the head end of the mattress. Mattress malfunction will occur if the partial non-return valve assembly is installed incorrectly (Refer to Figure 80).

Note: *Installing the partial non-return valve assembly is made easier if the parts are wetted with methylated spirit immediately prior to insertion. Do not allow excessive amounts of the methylated spirit into the body of the valve assembly.*

9.6 On cell assemblies 1 to 5, install the anchor clip onto the base sheet assembly at the manifold tube assembly end, as detailed in Para 5.3 (Refer to Page 129, Section 5).

9.7 Install the top cover (Refer to Page 124, Section 2).

Replacing the Non-Return Valve at the Foot End of the Mattress

9.8 Remove the top cover (Refer to Page 124, Section 2).

9.9 On cell assemblies 16 and 17 only (at the foot end of the mattress), remove the anchor clip from the base sheet assembly at the manifold tube assembly end ***ONLY***, as detailed in Para 4.2 (Refer to Page 127, Section 4).

Note: *Cell 1 is at the head end of the mattress, and cell 20 is at the foot end.*

9.10 Carefully remove both ends of the non-return valve (Fig 80, Item 20) from the manifold tube assembly.

9.11 Push the ends of the new non-return valve (Fig 80, Item 20) into the manifold tube assembly.

CAUTION: Make sure that the arrow mark on the non-return valve point towards the head end of the mattress (Refer to Figure 80). Mattress malfunction will occur if the non-return valve is installed incorrectly.

Note: *Installing the non-return valve is made easier if the parts are wetted with methylated spirit immediately prior to insertion. Do not allow excessive amounts of the methylated spirit into the body of the valve assembly.*

9.12 On cell assemblies 16 to 17, install the anchor clip onto the base sheet assembly at the manifold tube assembly end, as detailed in Para 5.3 (Refer to Page 129, Section 5).

9.13 Install the top cover (Refer to Page 124, Section 2).

10 Removing the Low-Air-Loss (LAL) Patch Tube Assembly

10.1 Remove the top cover (Refer to Page 124, Section 2).

10.2 On cell assemblies 17 and 18 only (at the foot end of the mattress), remove the anchor clip from the base sheet assembly at the manifold tube assembly end ***ONLY***, as detailed in Para 4.2 (Refer to Page 127, Section 4).

Note: *Cell 1 is at the head end of the mattress, and cell 20 is at the foot end.*

10.3 Disconnect the low-air-loss (LAL) patch tube assembly (Fig 80, Item 30) from the manifold tube assembly (Fig 78, Item 10), by carefully removing both sides of the T-connector on the end of the LAL patch tube assembly from the tubes in the manifold tube assembly.

Note: *The T-connector is part of the LAL patch tube assembly and not part of the manifold tube assembly.*

10.4 On cell assemblies 13 and 14 (at the foot end of the mattress), move the middle of the cell assemblies apart to reveal the end of the low-air-loss (LAL) patch, which is welded to the base sheet assembly (Refer to Figure 80).

10.5 Disconnect the LAL patch tube assembly (Fig 80, Item 30) from the side-entry grommet on the LAL patch.

10.6 Carefully pull one end of the LAL patch tube assembly through the cell retaining loop in the base sheet assembly, under cell assembly 18, and away from the mattress.

11 Installing the Low-Air-Loss (LAL) Patch Tube Assembly

The new low-air-loss (LAL) tube assembly has two connectors:

- A T-connector which connects to the manifold tube assembly.
- A straight connector which connects to the LAL patch on the base sheet assembly.

11.1 Put the LAL patch tube assembly (Fig 80, Item 30) in the correct position on the base sheet assembly, as follows:

11.1.1 Start from the outside of the mattress.

11.1.2 Pass the straight connector on the end of the LAL patch tube assembly over the top of the manifold tube assembly.

11.1.3 Carefully pass the straight connector on the LAL patch tube assembly under cell assembly 18 (at the foot end of the mattress) and through the cell retaining loop in the base sheet assembly.

Note: *Cell 1 is at the head end of the mattress, and cell 20 is at the foot end.*

11.1.4 On cell assemblies 13 and 14, move the middle of the cell assemblies apart to reveal the end of the LAL patch which is welded to the base sheet assembly.

11.1.5 Pull the straight connector on the LAL patch tube assembly underneath cell assemblies 17 to 14, until it is adjacent to the side-entry grommet on the LAL patch.

Note: *Installing the LAL patch tube assembly is made easier if the connectors are wetted with methylated spirit immediately prior to insertion.*

11.2 With cell assemblies 13 and 14 still separated, push the straight connector on the LAL patch tube assembly (Fig 80, Item 30) into the side-entry grommet on the LAL patch.

11.3 Connect the LAL patch tube assembly to the manifold tube assembly, by carefully inserting both sides of the T-connector on the end of the LAL patch tube assembly into the tubes in the manifold tube assembly.

11.4 On cell assemblies 17 and 18, install the anchor clip onto the base sheet assembly at the manifold tube assembly end, as detailed in Para 5.3 (Refer to Page 129, Section 5).

11.5 Re-position all cell assemblies evenly in the loops on the base sheet assembly, particularly the cell assemblies adjacent to the LAL patch.

11.6 Install the top cover (Refer to Page 124, Section 2).

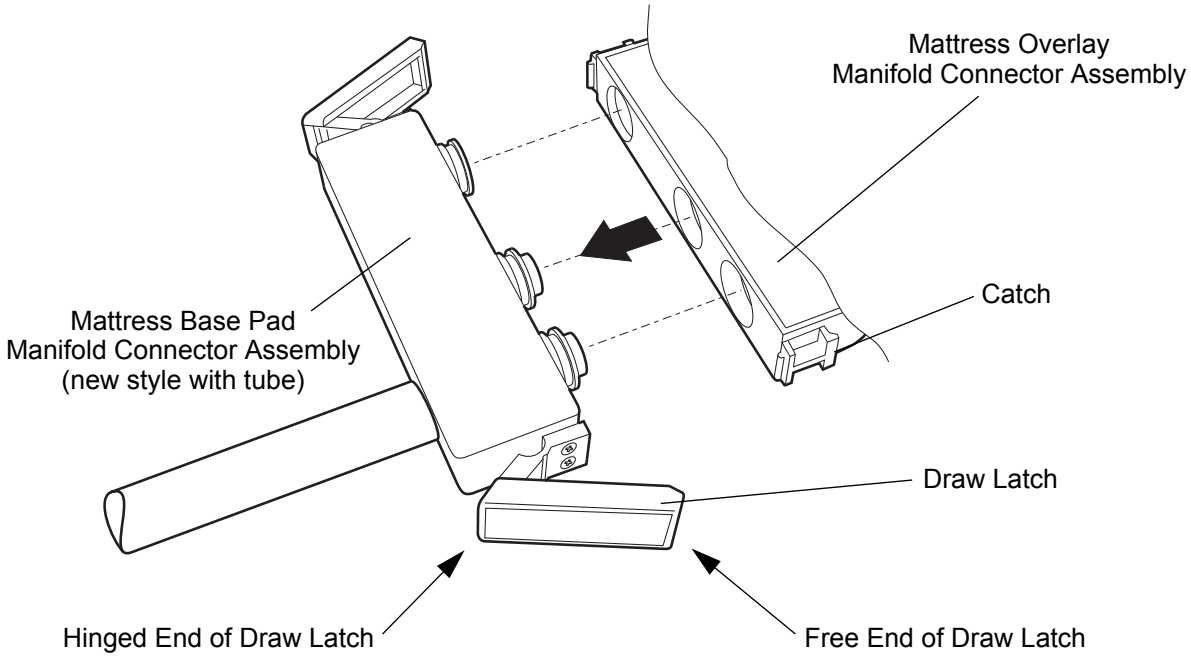


Figure 81 - Manifold Connector Assemblies on the Mattress Overlay and Mattress Base Pad

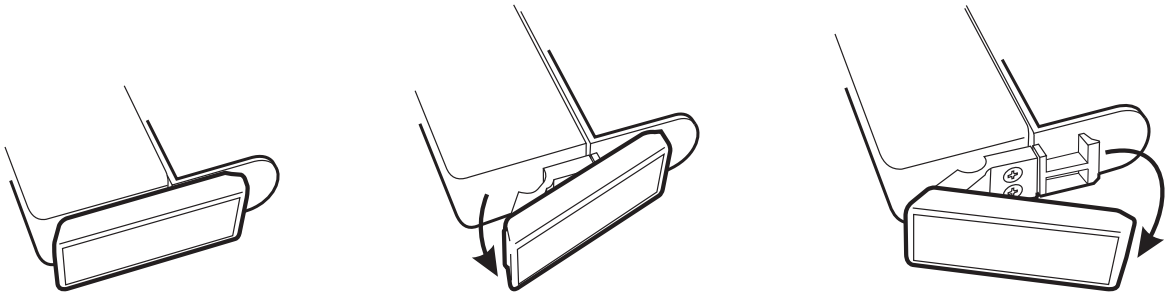


Figure 82 - Opening the Draw Latch on the Manifold Connector Assembly

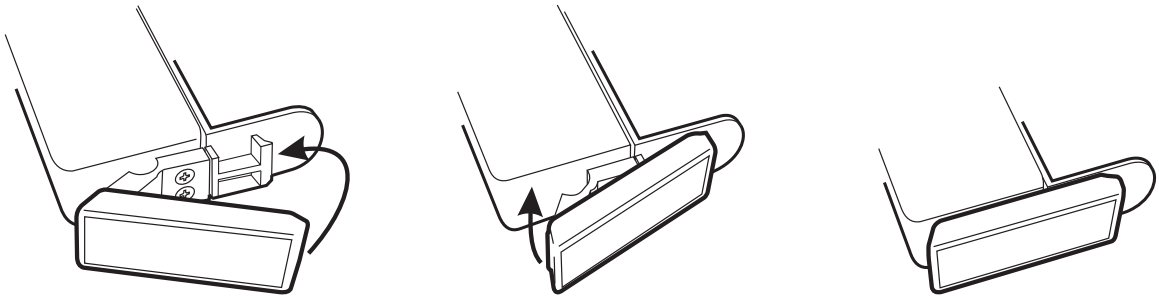


Figure 83 - Closing the Draw Latch on the Manifold Connector Assembly

12 Separating the Mattress Overlay from the Mattress Base Pad

There are two sets of zips on the mattress overlay:

- Two long zips which secure the top cover assembly to the mattress overlay.
- Two short zips which secure the mattress base pad to the mattress overlay.
- The two short zips are immediately below the two long zips.

There are zip flaps on the side of the top cover assembly which cover both sets of zips to prevent the ingress of contaminants.

Note: *It is not necessary to remove the top cover assembly to separate the mattress overlay from the mattress base pad.*

12.1 On the sides of the mattress, lift up the zip flap which covers the two sets of zips and undo the two short zips which secure the mattress overlay to the mattress base pad.

Note: *The two short zips are the lower of the two sets of zips.*

12.2 At the head end of the mattress, carefully lift the corner of the mattress overlay adjacent to the CPR assembly, to reveal the two manifold connector assemblies which connect the mattress overlay to the mattress base pad (Refer to Figure 81).

12.3 Open the two draw latches on the side of the manifold connector assembly on the mattress base pad, as follows (Refer to Figures 81 and 82):

12.3.1 Step 1: This shows the closed position of the draw latch.

12.3.2 Step 2: Lift the hinged end of the draw latch, so the draw latch is loose.

12.3.3 Step 3: Carefully pull the free end of the draw latch outwards and away from the manifold connector assembly.

12.4 Pull the two manifold connector assemblies apart (Refer to Figure 81).

12.5 Lift the mattress overlay away from the mattress base pad.

Note: *The manifold connector valves on the mattress overlay will automatically close when the mattress base pad is removed, allowing the mattress overlay to continue operating.*

13 Attaching the Mattress Overlay to the Mattress Base Pad

13.1 Position the mattress overlay on top of the mattress base pad, with the two manifold connector assemblies adjacent to each other.

13.2 Push the two manifold connector assemblies together (Refer to Figure 81).

Note: *Make sure there is no gap between the mating faces of the two manifold connector assemblies, particularly in the centre.*

13.3 Close the two draw latches on the side of the manifold connector assembly on the mattress base pad, as follows (Refer to Figures 81 and 82):

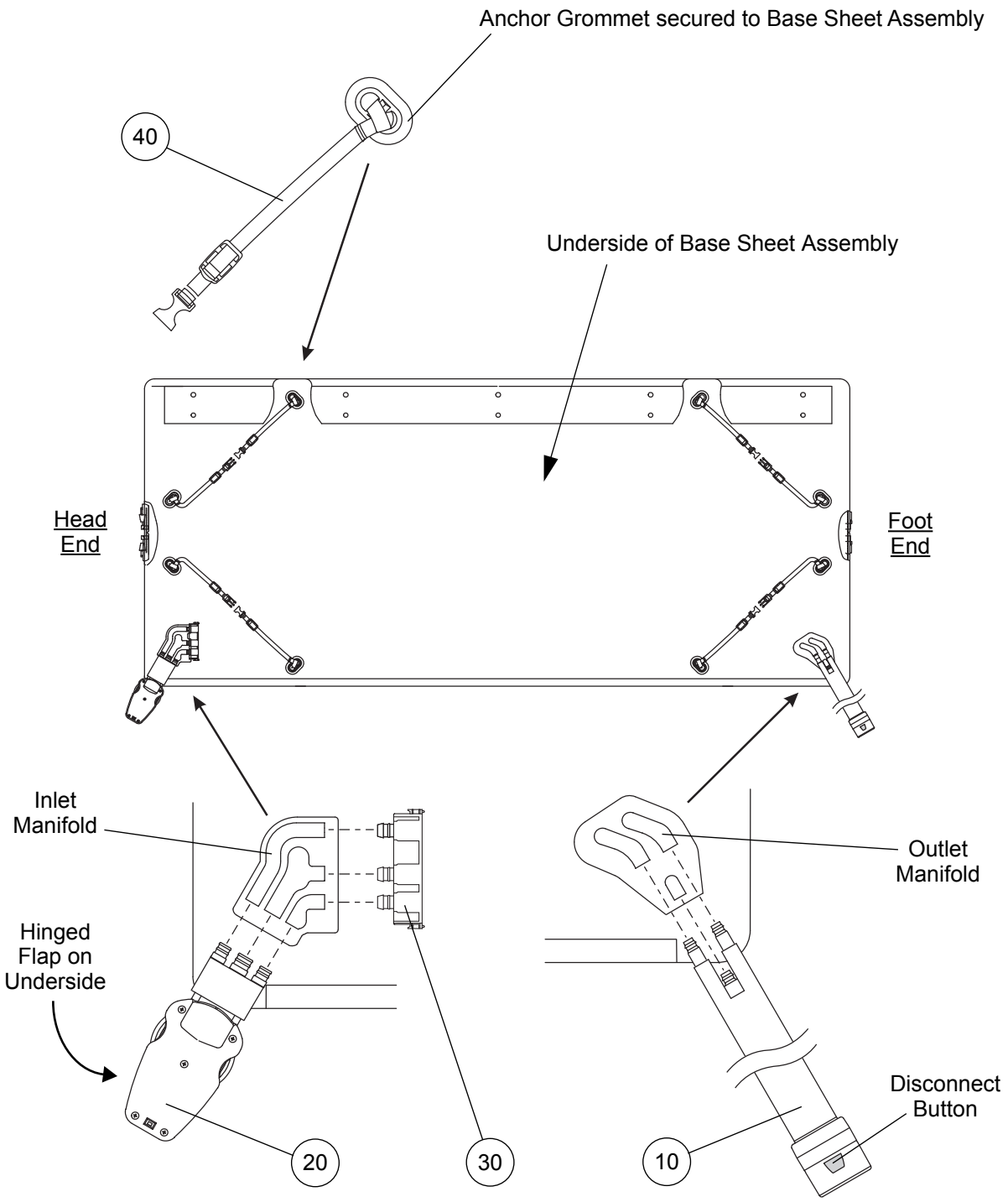
13.3.1 Step 1: Pull the free end of the draw latch over the catch on the manifold connector assembly on the mattress base pad.

13.3.2 Step 2: Push the hinged end of the draw latch down, so the draw latch pulls the two manifold connectors together and secures them.

13.3.3 Step 3: This shows the closed position of the draw latch.

13.4 Make sure the mattress overlay and mattress base pad are flat, and positioned correctly on top of each other.

13.5 On the sides of the mattress, lift up the zip flap and fasten the two short zips which secure the mattress overlay to the mattress base pad.



Note: Make sure the Hinged Flap on the CPR Unit is underneath

Note: Make sure the Disconnect Button on the Pump Connector is on top

Figure 84 - Underside View of Mattress Overlay

14 Removing the Pump Tubeset Assembly

The pump tubeset assembly (Fig 84, Item 10) comprises:

- The 3-way connector which fits on the pump.
- The moulded 3-way tubeset.
- The three connectors at the mattress end of the tubeset.

14.1 If the mattress overlay is attached to the mattress base pad, separate the mattress overlay from the mattress base pad (Refer to Page 138, Section 12).

14.2 Turn the mattress overlay over so that underside of the base sheet assembly is on top (Refer to Figure 84).

14.3 Pull the three connectors on the end of the pump tubeset assembly (Fig 84, Item 10) out of the outlet manifold on the base sheet assembly, and remove the pump tubeset assembly.

15 Installing the Pump Tubeset Assembly

15.1 Make sure the underside of the base sheet assembly is on top.

15.2 Position the new pump tubeset assembly (Fig 84, Item 10) adjacent to the outlet manifold on the underside of the base sheet assembly.

Note: *Make sure the orientation of the pump tubeset assembly is correct. The disconnect button must be on the top of the pump connector (Refer to Figure 84).*

15.3 Push the three connectors on the end of the pump tubeset assembly (Fig 84, Item 10) into the outlet manifold on the base sheet assembly.

Note: *Installing the connectors on the pump tubeset assembly is made easier if the parts are wetted with methylated spirit immediately prior to insertion.*

15.4 Turn the mattress overlay over so that underside of the base sheet assembly is on the bottom.

15.5 If the mattress overlay was separated from the mattress base pad, re-attach the mattress overlay to the mattress base pad (Refer to Page 139, Section 13).

Table 43 - Pump Tubeset, CPR, Manifold Connector Assemblies Parts List

Item	Part Number	Description	Qty
10	PXA700	Pump Tubeset Assembly - 800 mm standard tubeset	1
	PXA701	Pump Tubeset Assembly - 1200 mm tubeset	
20	PXA056	CPR Assembly	1
30	PXA074	Manifold Connector Assembly, Mattress Overlay	1
40	PXA073	Retaining Strap Assembly, Pair	4

16 Removing the CPR Assembly

The CPR (Cardio-Pulmonary Resuscitation) assembly (Fig 84, Item 20) comprises:

- The CPR unit.
- The short, moulded 3-way tubeset.
- The three connectors at the mattress end of the tubeset.

Note: *It is not necessary to remove the top cover assembly, or to separate the mattress overlay from the mattress base pad, in order to remove the CPR assembly.*

16.1 At the head end of the mattress adjacent to the CPR assembly, carefully lift up the zip flap, and then lift the corner of the mattress overlay away from the mattress base pad.

Note: *It may be necessary to undo the zip which secure the mattress overlay to the mattress base pad a short distance to make the CPR assembly more accessible.*

16.2 Pull the three connectors on the end of the CPR assembly (Fig 84, Item 20) out of the inlet manifold on the base sheet assembly, and remove the CPR assembly.

17 Installing the CPR Assembly

17.1 At the head end of the mattress adjacent to the CPR assembly, carefully lift up the zip flap, and then lift the corner of the mattress overlay away from the mattress base pad.

17.2 Position the new CPR assembly (Fig 84, Item 20) adjacent to the inlet manifold on the underside of the base sheet assembly.

Note: *Make sure the orientation of the CPR assembly is correct. The hinged flap on the front of the CPR unit must be on the underside, when looking directly at the inlet manifold on the underside of the base sheet assembly (Refer to Figure 84).*

17.3 Push the three connectors on the end of the CPR assembly (Fig 84, Item 20) into the inlet manifold on the base sheet assembly.

Note: *Installing the connectors on the CPR assembly is made easier if the parts are wetted with methylated spirit immediately prior to insertion.*

17.4 Make sure the mattress overlay and mattress base pad are flat, and positioned correctly on top of each other.

17.5 Make sure the zip(s) adjacent to the CPR assembly have been completely re-fastened.

18 Removing the Manifold Connector Assembly from the Mattress Overlay

18.1 If the mattress overlay is attached to the mattress base pad, separate the mattress overlay from the mattress base pad (Refer to Page 138, Section 12).

18.2 Turn the mattress overlay over so that underside of the base sheet assembly is on top (Refer to Figure 84).

18.3 Pull the three connectors on the end of the manifold connector assembly (Fig 84, Item 30) out of the inlet manifold on the base sheet assembly, and remove the manifold connector assembly.

19 Installing the Manifold Connector Assembly onto the Mattress Overlay

19.1 Position the new manifold connector assembly (Fig 84, Item 30) adjacent to the inlet manifold on the underside of the base sheet assembly.

Note: *The position of the three connectors means that the manifold connector assembly can only be installed the correct way round.*

19.2 Push the three connectors on the end of the manifold connector assembly (Fig 84, Item 30) into the inlet manifold on the base sheet assembly.

Note: *Installing the connectors on the manifold connector assembly is made easier if the parts are wetted with methylated spirit immediately prior to insertion.*

19.3 Turn the mattress overlay over so that underside of the base sheet assembly is on the bottom.

19.4 If the mattress overlay was separated from the mattress base pad, re-attach the mattress overlay to the mattress base pad (Refer to Page 139, Section 13).

20 Removing a Retaining Strap Assembly

20.1 If the mattress overlay is attached to the mattress base pad, separate the mattress overlay from the mattress base pad (Refer to Page 138, Section 12).

20.2 Turn the mattress overlay over so that underside of the base sheet assembly is on top (Refer to Figure 84).

20.3 Separate the clips, and untie or cut through the webbing on the retaining strap assembly (Fig 84, Item 40) where it is secured to the anchor grommet on the base sheet assembly, and remove the webbing from the anchor grommet.

20.4 Remove the mating retaining strap assembly.

21 Installing a Retaining Strap Assembly

There are four retaining strap assemblies on the mattress overlay. Each retaining strap assembly comprises two different retaining straps, as follows:

- Retaining strap “A” is a length of webbing with a side-release buckle. These are attached to the anchor grommets at the side of the base sheet assembly.
- Retaining strap “B” is a length of webbing with a mating receptacle. These are attached to the anchor grommets in the middle of the base sheet assembly.

Note: *Always replace both retaining straps, and make sure that the correct retaining straps are installed in the correct positions.*

21.1 Insert the plain end of the webbing on the retaining strap assembly (Fig 84, Item 40) into the anchor grommet, and under the anchor bar.

21.2 Feed the plain end of the webbing through until the end exits the opposite side of the anchor grommet.

21.3 Open the loop on the plain end of the webbing, and insert the other end of the webbing with the side-release buckle or mating receptacle through the loop.

21.4 Tighten the webbing on the anchor grommet to secure.

21.5 Repeat the procedure to install the mating retaining strap.

21.6 Turn the mattress overlay over so that underside of the base sheet assembly is on the bottom.

21.7 If the mattress overlay was separated from the mattress base pad, re-attach the mattress overlay to the mattress base pad (Refer to Page 139, Section 13).

22 Replacing the Base Sheet Assembly

22.1 If not already carried out, separate the mattress overlay from the mattress base pad (Refer to Page 138, Section 12).

22.2 Remove the top cover (Refer to Page 124, Section 2).

22.3 Remove all 20 cell assemblies (Refer to Page 127, Section 4).

22.4 Remove the low-air-loss (LAL) patch tube assembly (Refer to Page 136, Section 10).

22.5 Remove the manifold tube assembly (Refer to Page 131, Section 6).

22.6 Remove the pump tubeset assembly (Refer to Page 141, Section 14).

22.7 Remove the CPR assembly (Refer to Page 142, Section 16).

22.8 Remove the manifold connector assembly from the mattress overlay (Refer to Page 142, Section 18).

22.9 Remove all four retaining strap assemblies (Refer to Page 143, Section 20).

22.10 Discard the old base sheet assembly.

22.11 Place a new base sheet assembly (Table 44 Item 10 or 20) down on a flat surface.

Note: *Make sure the correct base sheet assembly is fitted. Table 44, Item 10 is for mattress overlays, and has only two zips which attach the top cover assembly to the base sheet assembly. Table 44, Item 20 is for mattress replacements, and has two additional zips to attach the mattress overlay to the mattress base pad.*

22.12 Install all four retaining strap assemblies (Refer to Page 143, Section 21).

22.13 Install the manifold connector assembly onto the mattress overlay (Refer to Page 142, Section 19).

22.14 Install the CPR assembly (Refer to Page 142, Section 17).

22.15 Install the pump tubeset assembly (Refer to Page 141, Section 15).

22.16 Install the manifold tube assembly (Refer to Page 131, Section 7).

22.17 Install the low-air-loss (LAL) patch tube assembly (Refer to Page 136, Section 11).

22.18 Install all 20 cell assemblies (Refer to Page 129, Section 5).

22.19 Install the top cover (Refer to Page 124, Section 3).

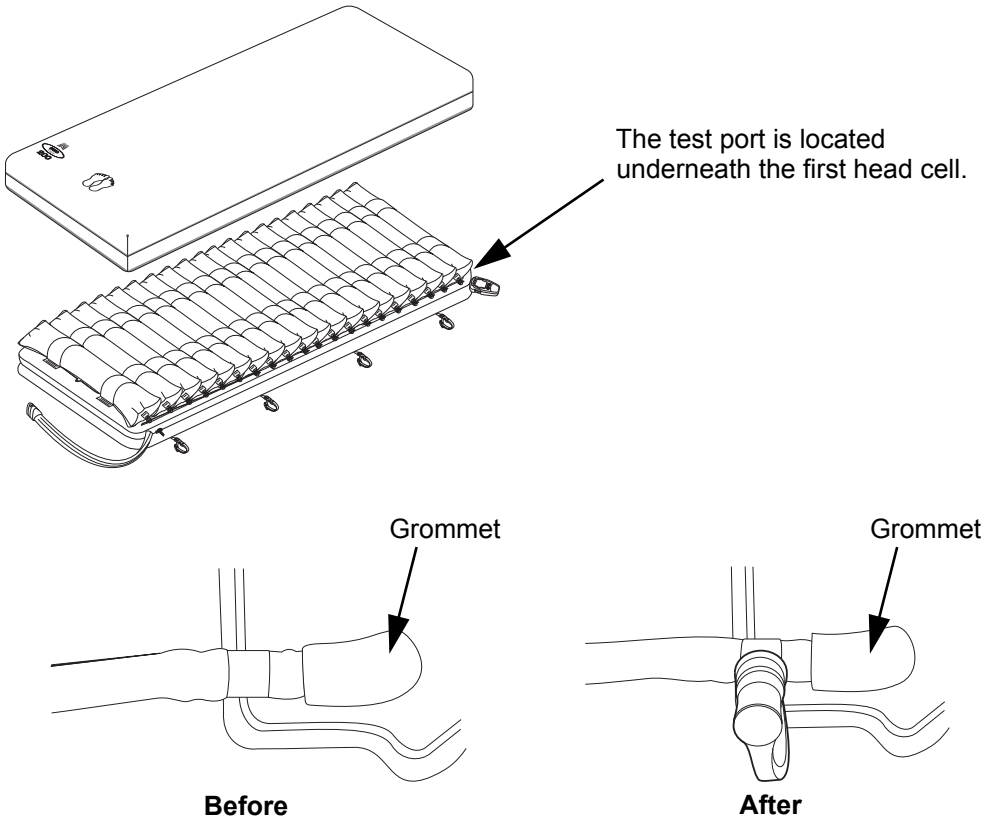
22.20 If the mattress overlay was separated from the mattress base pad, re-attach the mattress overlay to the mattress base pad (Refer to Page 139, Section 13).

Table 44 - Base Sheet Assembly Parts List

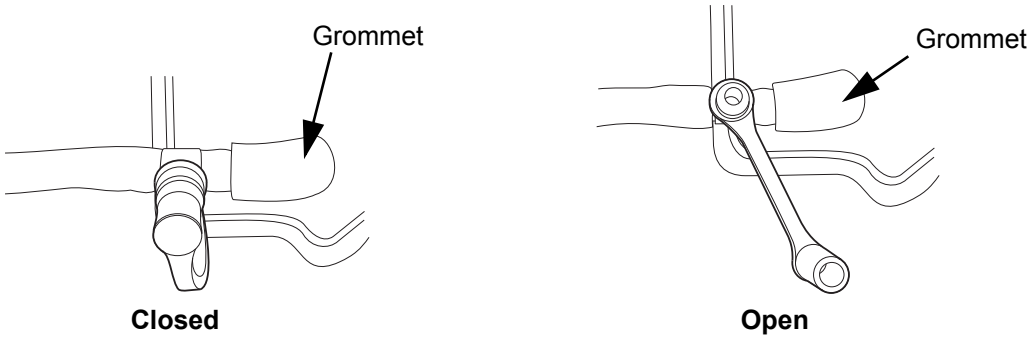
Item	Part Number	Description	Qty
10	PXA170	Base Sheet Assembly, for Mattress Overlay only	1
	PXA290	Base Sheet Assembly (Narrow), for Mattress Overlay Auto Logic 110	1
20	PXB170	Base Sheet Assembly, for Mattress Replacement only	1
	PXB290	Base Sheet Assembly (Narrow), for Mattress Replacement Auto Logic 200	1

23 Mattress Test Port (July 2004 Onward)

23.1 The addition of the test port (PXA077) into the Cell-In-Cell static line is to allow the measurement of pressure in the inner cells and, the periphery of the B Pad. This static portion of the mattress is created by the red non-return valve which is located near the foot end of the manifold, therefore the test port has to be positioned on the static side of the valve. This change was introduced by the mattress project team as a requirement for Final Build transport testing. The image below shows the location of the test port, and the setup both before and after the addition introduction



23.2 The image below shows the test port in both the open, and closed position. This **MUST** be checked without fail, both once the test port has been used, and if a **LOW PRESSURE** alarm condition is indicated. If the test port is not closed the mattress will not function correctly.



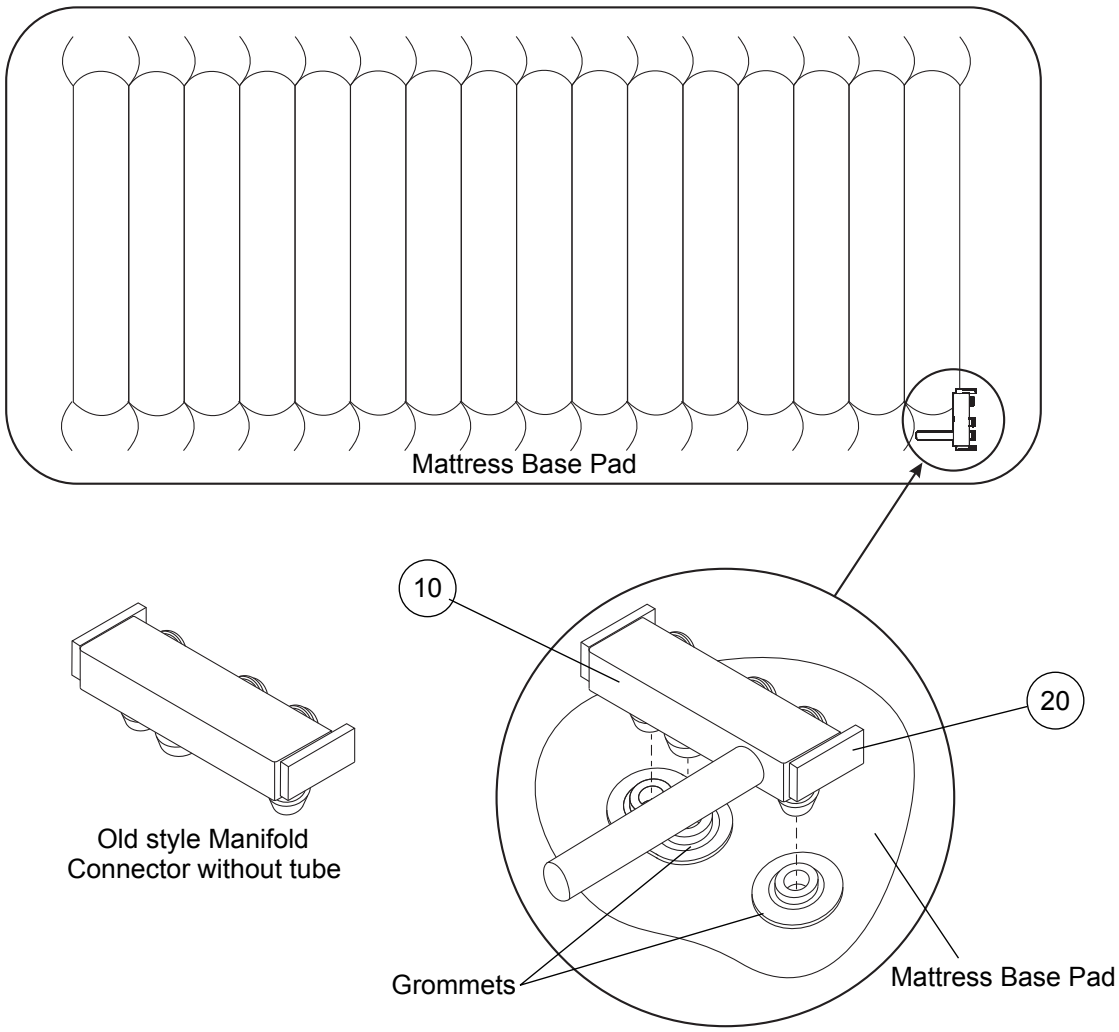
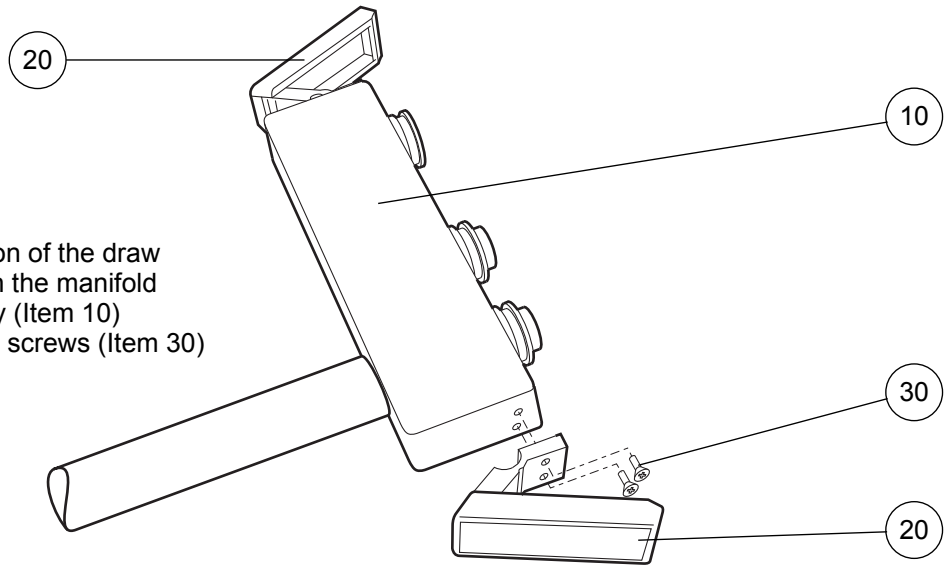


Figure 85 - Replacing the Manifold Connector Assembly on the Mattress Base Pad



Note:
Check the orientation of the draw latches (Item 20) on the manifold connector assembly (Item 10) before installing the screws (Item 30)

Figure 86 - Replacing the Draw Latches on the Manifold Connector Assembly

24 Removing the Manifold Connector Assembly from the Mattress Base Pad

24.1 If the mattress overlay is attached to the mattress base pad, separate the mattress overlay from the mattress base pad (Refer to Page 138, Section 12).

24.2 Pull the three connectors on the end of the manifold connector assembly (Fig 85, Item 10) out of the three grommets in the mattress base pad, and remove the manifold connector assembly.

25 Installing the Manifold Connector Assembly onto the Mattress Base Pad

Note: *The old style manifold connector (without tube) is no longer available and must be replaced with the new style PXB307 (Fig 85, Item 10) if damaged. If this item is replaced, then the complete Base Pad assembly must also be replaced with the new Base Pad assembly. Refer to Page 150, Table 47 for compatibility and part numbers.*

25.1 Position the new manifold connector assembly (Fig 85, Item 10) adjacent to the three grommets on the mattress base pad.

Note: *The position of the three connectors means that the manifold connector assembly can only be installed the correct way round.*

25.2 Push the three connectors on the end of the manifold connector assembly (Fig 85, Item 10) into the three grommets in the mattress base pad.

Note: *Installing the connectors on the manifold connector assembly is made easier if the parts are wetted with methylated spirit immediately prior to insertion.*

25.3 If the mattress overlay was separated from the mattress base pad, re-attach the mattress overlay to the mattress base pad (Refer to Page 139, Section 13).

26 Replacing the Draw Latches on the Manifold Connector Assembly

26.1 If the mattress overlay is attached to the mattress base pad, separate the mattress overlay from the mattress base pad (Refer to Page 138, Section 12).

Note: *It is not necessary to remove the manifold connector assembly from the mattress base pad in order to replace the draw latches.*

26.2 Remove the two screws (Fig 86, Item 30) and the draw latch (Fig 86, Item 20) from the side of the manifold connector assembly (Fig 86, Item 10).

26.3 Discard the old draw latch.

26.4 Put the new draw latch (Fig 86, Item 20) in position on the side of the manifold connector assembly (Fig 86, Item 10).

Note: *Make sure the orientation of the draw latch is correct.*

26.5 Install the two screws (Fig 86, Item 30) to secure the draw latch.

26.6 Repeat for the other draw latch.

26.7 If the mattress overlay was separated from the mattress base pad, re-attach the mattress overlay to the mattress base pad (Refer to Page 139, Section 13).

Table 45 - Manifold Connector Assembly Parts List

Item	Part Number	Description	Qty
10	PXB307	Manifold Connector Assembly (New style)	1
20	PXA358	Draw Latch	2
30	PXA359	Screw, 2.5mm dia x 10mm Csk Head	4

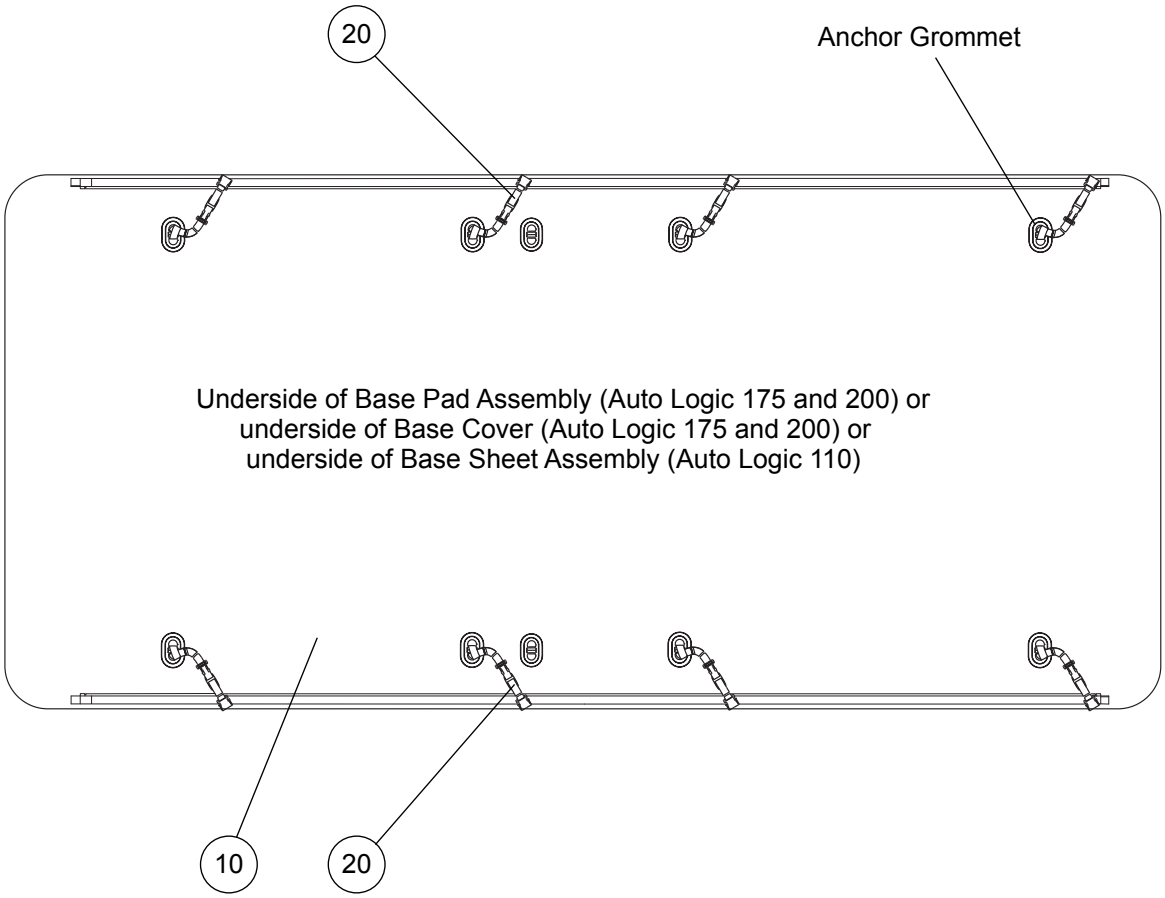

20
Anchor Grommet
Underside of Base Pad Assembly (Auto Logic 175 and 200) or
underside of Base Cover (Auto Logic 175 and 200) or
underside of Base Sheet Assembly (Auto Logic 110)
10
20

Figure 87 - Replacing the Retaining Strap Assemblies

Table 46 - Base Pad/Sheet and Retaining Strap Assemblies Parts List

Item	Part Number	Description	Qty
10	PXB055	Auto Logic 200 Base Pad Assembly - Standard (superseded by PXB060)	1
	PXB060	Auto Logic 200 Base Pad Assembly - Standard	
	PXB255	Auto Logic 200 Base Pad Assembly - Narrow (superseded by PXB260)	
	PXB260	Auto Logic 200 Base Pad Assembly - Narrow	
	PXB330	Auto Logic 175 Foam Spare Assembly	
	PXB061	• Auto Logic 175 & 200 Base Cover	
	PXB261	• Auto Logic 200 Base Cover - Narrow	
	PXA170	Auto Logic 110 Base Sheet Assembly	
	PXA290	Auto Logic 110 Base Sheet Assembly - Narrow	
20	PXB073	Retaining Strap Assembly	8

27 Removing a Retaining Strap Assembly

27.1 Turn the mattress over so that underside of the base pad is on top (Refer to Figure 87).

27.2 Separate the clips, and untie or cut through the webbing on the retaining strap assembly (Fig 87, Item 20) where it is secured to the anchor grommet on the base pad, and remove the webbing from the anchor grommet.

28 Installing a Retaining Strap Assembly

Each retaining strap comprises:

- A length of webbing.
- A side release buckle (male) and a mating receptacle (female).

28.1 Insert the plain end of the webbing on the retaining strap assembly (Fig 87, Item 20) into the anchor grommet, and under the anchor bar.

28.2 Feed the plain end of the webbing through until the end exits the opposite side of the anchor grommet.

28.3 Open the loop on the plain end of the webbing, and insert the other end of the webbing with the side-release buckle or mating receptacle through the loop.

28.4 Tighten the webbing on the anchor grommet to secure.

28.5 Turn the mattress overlay over so that underside of the base sheet assembly is on the bottom.

29 Replacing the Base Pad Sub-Assembly

Note: *Later versions of the Auto Logic Base Pad (2008 onwards) are designed to be of a more modular construction. The new Base Pad assembly is fully interchangeable with the old Base Pad assembly and features a separate base cover. Refer to Page 148, Table 46.*

29.1 If not already carried out, separate the mattress overlay from the mattress base pad (Refer to Page 138, Section 12).

29.2 Remove the manifold connector assembly from the mattress base pad (Refer to Page 142, Section 18).

29.3 Remove all eight retaining strap assemblies (Refer to Page 143, Section 20).

29.4 Discard the old base pad sub-assembly (Fig 87, Item 10).

29.5 Place a new base pad sub-assembly (Fig 87, Item 10) down on a flat surface.

29.6 Install all eight retaining strap assemblies (Refer to Page 143, Section 21).

29.7 Install the manifold connector assembly onto the mattress base pad (Refer to Page 142, Section 19).

29.8 If the mattress overlay was separated from the mattress base pad, re-attach the mattress overlay to the mattress base pad (Refer to Page 139, Section 13).

29.9 After carrying out the replacement, the mattress must be tested for serviceability. Perform an inflation test on the mattress in accordance with Chapter 4 “Testing”, Page 75, Section 20.

30 Interchangeability of New and Old Auto Logic 200 Spare Parts

Table 47 - Old and New Auto Logic 200 Spare Parts interchangeability

Old Part No.	New Part No.	Description	Interchangeability
PXB055	PXB060	Auto Logic 200 Base Pad Assembly - Standard	Fully interchangeable
PXB255	PXB260	Auto Logic 200 Base Pad Assembly - Narrow	Fully interchangeable
	PXB063	Auto Logic 200 Base Pad - Standard (Air filled inner)	Only use with the new assembly Base Cover - Standard
	PXB263	Auto Logic 200 Base Pad - Narrow (Air filled inner)	Only use with the new assembly Base Cover - Narrow
	PXB061	Auto Logic 175 & 200 Base Cover - Standard	Only use with the new air-filled base sub assembly - Standard
	PXB261	Auto Logic 200 Base Cover - Narrow	Only use with the new air-filled base sub assembly - Narrow
PXA325 (obsolete)	PXB307	Base Pad Connector (New)	Only use the new part with the new air-filled base sub assemblies - Standard & Narrow

31 Press Stud Replacement

31.1 Make sure that the two halves of the die set (Fig 88, Item 20) are installed in the jaws of the hand press tool (Fig 88, Item 10).

31.2 Remove the old press stud parts from the mattress, if necessary using side-cutters, taking care not to damage the mattress fabric.

31.3 Place the new stud post (Table 48, Item 30) in the location hole in the assembly where it is to be fitted.

Note: *Check with similar studs for the correct position.*

31.4 Position the stud post and assembly in the hand press tool.

31.5 Depending on which is to be fitted, fit a stud cap (Table 48, Item 40) or stud socket (Table 48, Item 50) onto the stud post, and firmly squeeze the handles of the hand press tool together.

31.6 Remove the secured press stud assembly from the hand press tool.

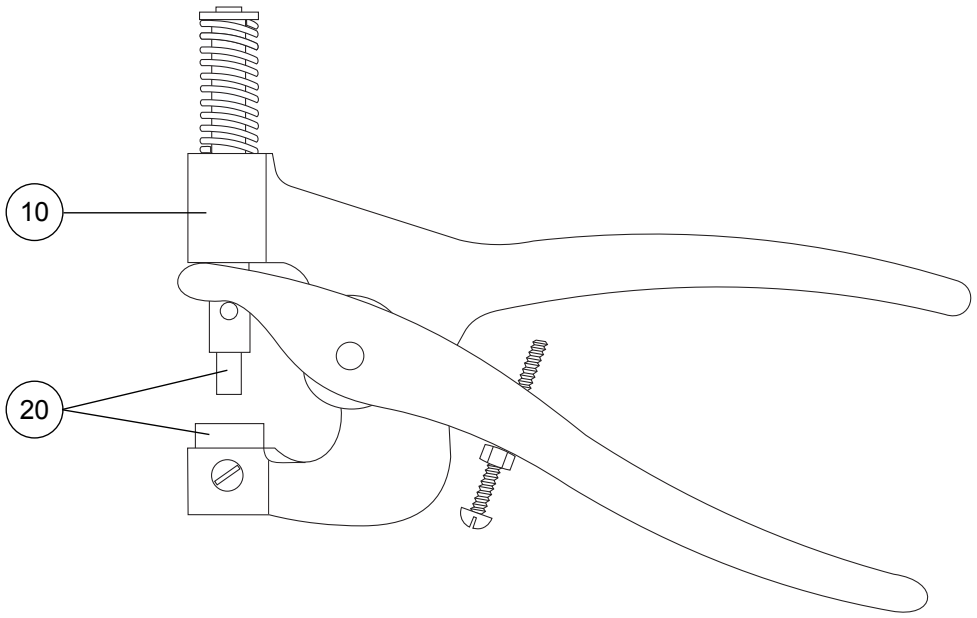


Figure 88 - Press Stud Tool

Table 48 - Press Stud Parts List

Item	Part Number	Description	Qty
10	MIS143	Hand Press Tool	1
20	MIS142	Die Set (for Hand Press Tool - Item 10)	1
30	FAS169	Stud Post, Schaeffer Plastic	A/R
40	FAS170	Stud Cap, Schaeffer Plastic	A/R
50	FAS171	Stud Socket, Schaeffer Plastic	A/R

CHAPTER 7

SEAT CUSHION REPAIR

1 General

This chapter details repair procedures for the **Aura Logic** seat cushion. All repairs should be carried out by ArjoHuntleigh approved service personnel.

To carry out the repair procedures, fully deflate the seat cushion first, as follows:

1.1 Disconnect the tubeset between the seat cushion and the pump.

1.2 Depress the two small dump valves on the underside of the seat cushion base cover to deflate the seat cushion.

After carrying out a service or any repairs, the seat cushion must be tested for serviceability. Carry out an inflation test on the seat cushion in accordance with Chapter 4 “Testing”, Page 75, Section 20.

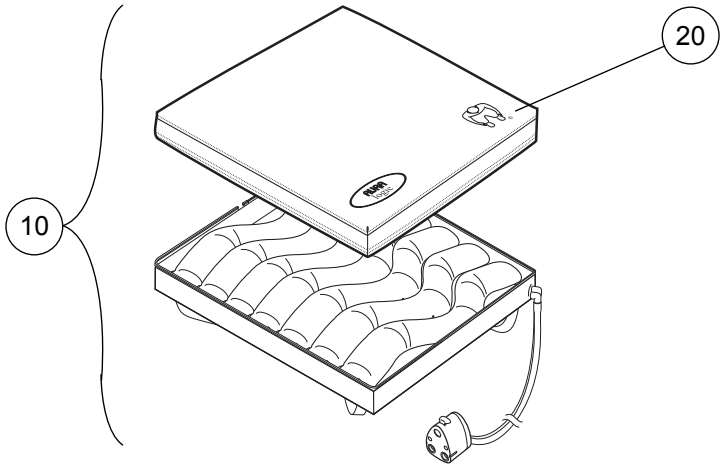


Figure 89 - Aura Logic Seat Cushion Assembly

Table 49 - Aura Logic Seat Cushion Parts List

Item	Part Number	Description	Qty
10	PXS001	Aura Logic Seat Cushion Assembly	1
20	PXS062	• Top Cover Assembly	1

2 Removing the Top Cover Assembly

2.1 Undo the zip which secures the top cover assembly (Table 49, Item 10) to the base sheet assembly.

2.2 Remove the top cover assembly.

3 Installing the Top Cover Assembly

3.1 Position the top cover assembly (Table 49, Item 10) over the base sheet assembly, with the logo uppermost.

3.2 Fasten the zip to secure the top cover assembly to the base sheet assembly.

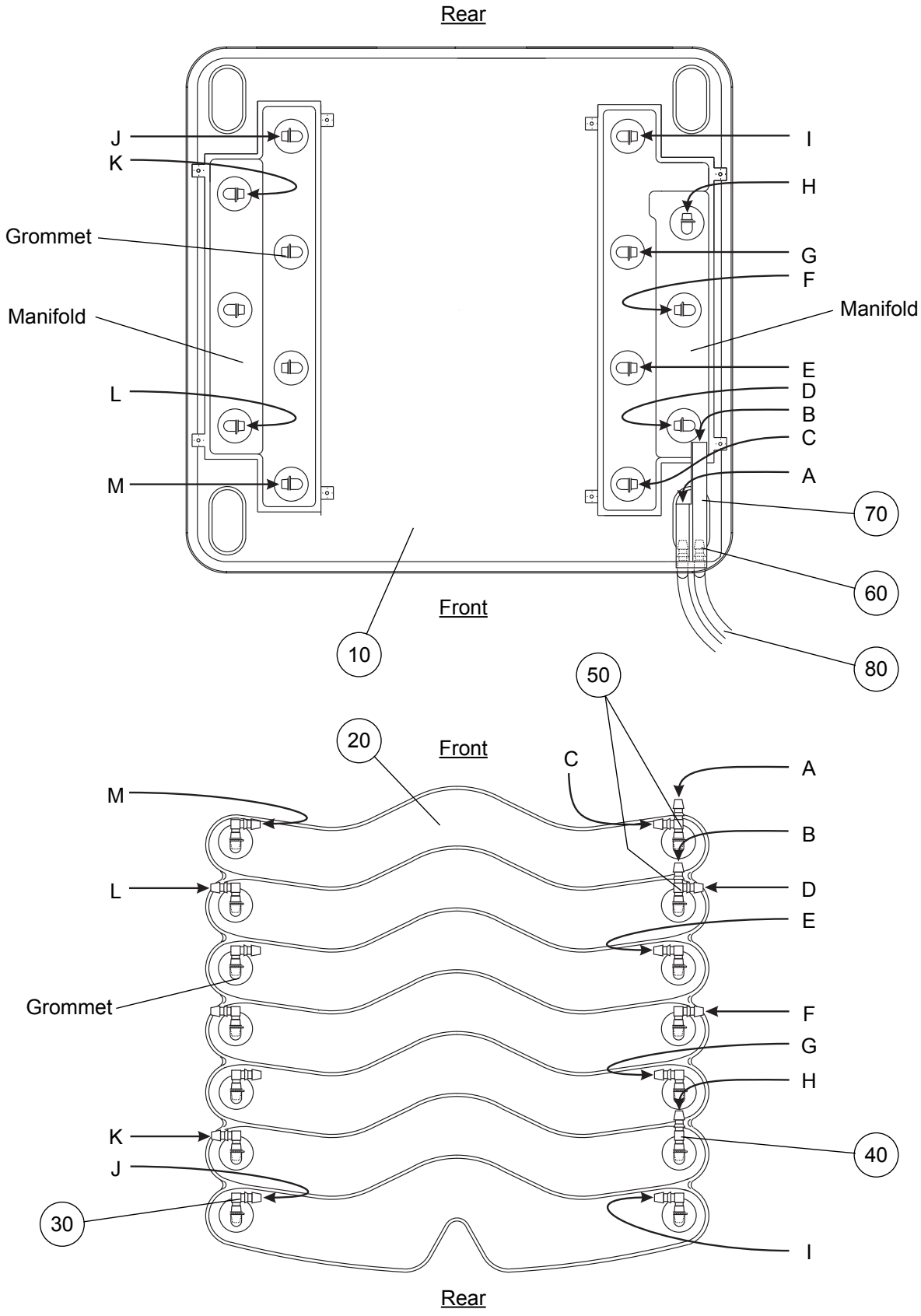


Figure 90 - Replacing the Welded Cell Assembly

4 Removing the Welded Cell Assembly

The seven cells in the seat cushion are not individual replaceable cells but are manufactured as a single welded assembly which can only be replaced as a single complete item (the welded cell assembly).

There are four short manifolds welded into the base sheet assembly, two at each side of the welded cell assembly. The welded cell assembly is connected to the manifolds via 14 connectors (elbow, straight and “T” pieces).

4.1 Remove the top cover assembly (Refer to Page 153, Section 89).

4.2 Carefully pull the two T-connectors (Fig 90, Item 50) out of the internal tube assembly (Fig 90, Item 70).

4.3 Carefully pull the 14 connectors (Fig 90, Items 30, 40 and 50) out of the grommets on the manifolds on the base assembly (Fig 90, Item 10).

Note: *Keep all 14 connectors in the grommets on the welded cell assembly (Fig 90, Item 20).*

4.4 Carefully pull all 14 connectors (Fig 90, Items 30, 40 and 50) out of the grommets in the welded cell assembly (Fig 90, Item 20).

5 Installing the Welded Cell Assembly

Note: *The labels by each connector on Figure 90, e.g. “A”, “B”, etc., are an aid to installing the welded cell assembly, by showing which connector on the welded cell assembly is connected to which grommet on the base assembly i.e. “A” to “A”, etc.*

5.1 Put the base assembly (Fig 90, Item 10) and the welded cell assembly (Fig 90, Item 20) down with the grommets pointing upwards.

Note: *Installing the connectors is made easier if the parts are wetted with methylated spirit immediately prior to insertion.*

5.2 Push the following connectors into the grommets on the welded cell assembly:

5.2.1 The single straight connector (Fig 90, Item 40), labelled “H”.

5.2.2 The two T-connectors (Fig 90, Item 50), labelled “C” and “D”.

5.2.3 The 11 elbow connectors (Fig 90, Item 30), labelled “E” to “G” and “I” to “M”.

Note: *Make sure the orientation of each of the 14 connectors is exactly as shown in Figure 90.*

Table 50 - Welded Cell Assembly Parts List

Item	Part Number	Description	Qty
10	PXS059	Base Assembly	1
20	PXS056	• Cell Assembly, Welded	1
30	403305	• • Connector, Elbow	11
40	PXS302	• • Connector, Straight	1
50	401300	• • T-Connector	2
60	PXS309	• • Connector, Stepped	2
70	PXS067	• • Tube Assembly, Internal	1
80	PXS700	• Pump Tubeset Assembly	1

5.3 Turn the welded cell assembly over so that the connectors are on the bottom.

5.4 Position the welded cell assembly on top of the base assembly.

Note: *Make sure the front of the welded cell assembly is directly above the front of the base assembly (Refer to Figure 90).*

5.5 Push the two T-connectors (Fig 90, Item 50) into the ends of the internal tube assembly (Fig 90, Item 70), labelled “A” and “B”.

5.6 Push the 14 connectors on the welded cell assembly into the corresponding grommet in the manifolds on the base assembly (Fig 90, Item 10), labelled “C” to “M”.

5.7 Install the top cover assembly (Refer to Page 153, Section 3).

6 Removing the Pump Tubeset Assembly

Note: *It is not necessary to remove the top cover assembly to remove the pump tubeset assembly.*

6.1 Carefully pull the two tubes on the pump tubeset assembly (Fig 90, Item 80) off of the two stepped connectors (Fig 90, Item 60), which are attached to the internal tube assembly (Fig 90, Item 70).

Note: *Leave the two stepped connectors and internal tube assembly connected to the seat cushion.*

7 Installing the Pump Tubeset Assembly

7.1 Push the two tubes on the pump tubeset assembly (Fig 90, Item 80) onto the two stepped connectors (Fig 90, Item 60), which are attached to the internal tube assembly (Fig 90, Item 70), and remove the pump tubeset assembly.

Note: *Installing the connectors is made easier if the parts are wetted with methylated spirit immediately prior to insertion.*

Note: *The orientation of the two tubes on the pump tubeset assembly is not important.*

8 Removing a Retaining Strap Assembly

8.1 Turn the seat cushion over so that retaining strap assemblies (Fig 91, Item 10) are on top.

8.2 Separate the clips, and untie or cut through the webbing on the retaining strap assembly where it is secured to the anchor grommet on the base assembly, and remove the webbing from the anchor grommet.

8.3 Remove the mating retaining strap assembly.

9 Installing a Retaining Strap Assembly

There are two retaining strap assemblies on the seat cushion, and each one comprises two different retaining straps. Both retaining straps have both a side-release buckle and a mating receptacle: one has the side-release buckle at the end of the long strap and the other has the mating receptacle at the end of the long strap.

Note: *Always replace both retaining straps, and make sure that the correct retaining straps are installed in the correct positions (Refer to Figure 91).*

9.1 Insert the plain end of the webbing on the retaining strap assembly (Fig 91, Item 10) into the anchor grommet, and under the anchor bar.

9.2 Feed the plain end of the webbing through until the end exits the opposite side of the anchor grommet.

9.3 Open the loop on the plain end of the webbing, and insert the other end of the webbing with the side-release buckle or mating receptacle through the loop.

9.4 Tighten the webbing on the anchor grommet to secure.

9.5 Repeat the procedure to install the mating retaining strap.

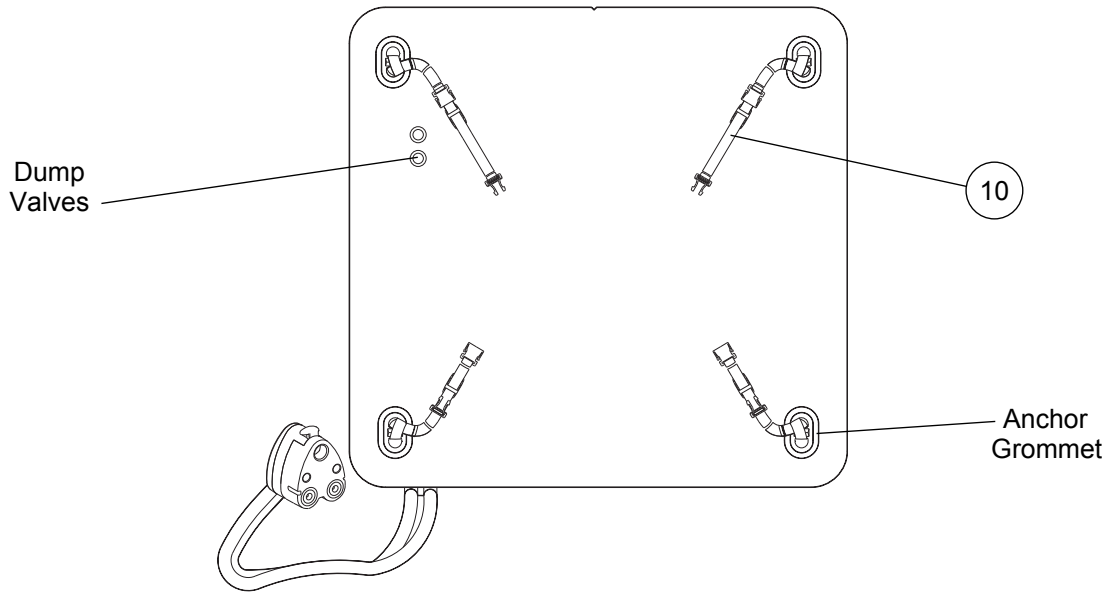


Figure 91 - Replacing a Retaining Strap Assembly

Table 51 - Retaining Strap Assembly Parts List

Item	Part Number	Description	Qty
10	PXS066	Retaining Strap Assembly, Pair	2

10 Replacing the Base Assembly

10.1 Remove the top cover assembly (Refer to Page 153, Section 89).

10.2 Remove the pump tubeset assembly from the base assembly (Refer to Page 156, Section 6).

10.3 Remove the two stepped connectors (Fig 90, Item 60) and internal tube assembly (Fig 90, Item 70) from the base assembly.

10.4 Remove the welded cell assembly from the base assembly (Refer to Page 155, Section 4).

Note: *Make sure all 14 connectors (Fig 90, Items 30, 40 and 50) are removed from the grommets on the manifolds on the base assembly (Fig 90, Item 10).*

10.5 Remove both retaining strap assemblies (Refer to Page 156, Section 8).

10.6 Discard the old base assembly.

10.7 Place a new base assembly (Table 52, Item 10) down on a flat surface.

10.8 Install the welded cell assembly onto the base assembly (Refer to Page 155, Section 5).

10.9 Push the internal tube assembly (Fig 90, Item 70) onto the two T-connectors (Fig 90, Item 50) on the welded cell assembly, labelled “A” and “B”.

Note: *Refer to Figure 90 for the orientation of the internal tube assembly.*

10.10 Push the two stepped connectors (Fig 90, Item 60) into the ends of the internal tube assembly.

10.11 Install the pump tubeset assembly onto the stepped connectors (Refer to Page 156, Section 7).

10.12 Install both retaining strap assemblies (Refer to Page 156, Section 9).

10.13 Install the top cover assembly (Refer to Page 153, Section 3).

Table 52 - Base Assembly Parts List

Item	Part Number	Description	Qty
10	PXS059	Base Assembly	1

CHAPTER 8

INTELLIGENT BATTERY PACK ASSEMBLY

1 General

An optional intelligent battery pack is available which allows the pump to be used independently of the mains/power supply. The battery pack slides onto the base of the pump.

2 Installing and Removing the Battery Pack

2.1 To install the battery pack onto the pump (Refer to Figure 92):

2.1.1 Remove the battery socket cover from the base of the pump.

2.1.2 From the front of the pump, slide the battery pack over the guides on the base of the pump, and click into place.

2.2 To remove the battery pack from the pump (Refer to Figure 92):

2.2.1 Depress the **Reset/Status Latch** at the rear of the pump/battery pack.

2.2.2 Slide the battery out from the base of the pump, towards the front of the pump.

2.2.3 Install the battery socket cover onto the base of the pump.

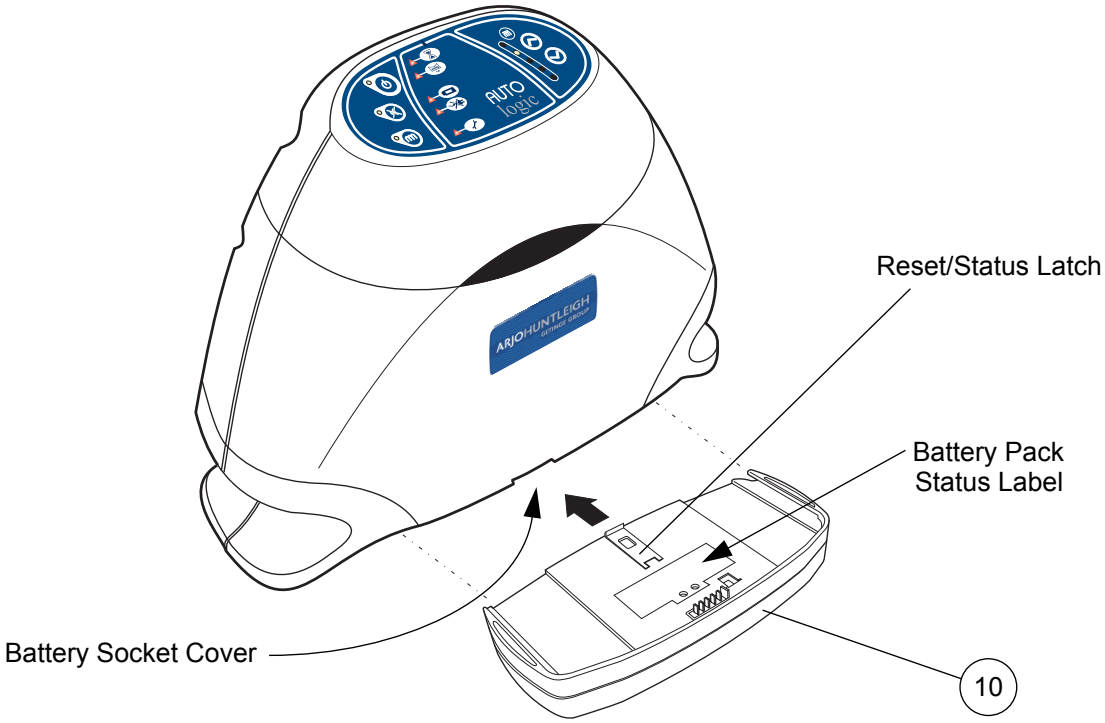


Figure 92 - Installing the Intelligent Battery Pack Assembly

Table 53 - Intelligent Battery Pack Assembly Parts List

Item	Part Number	Description	Qty
10	BBP600	Intelligent Battery Pack Assembly	1

3 Checking the Status of the Battery Pack

Battery Pack Status Label

Refer to Figure 92 for the position of the battery pack status label.

Refer to Figure 93 for details of the LED indicators and symbols on the battery pack status label.

To Check the Battery Pack Status (Refer to Figures 92 and 93)

3.1 Remove the battery pack from the pump unit (Refer to Page 159, Section 2).

3.2 Press the **Reset/Status Latch**, which will activate the two LED indicators (**LED 1** and **LED 2**) on the battery pack status label.

3.3 Refer to Chapter 2 “Troubleshooting”, Page 33, Section 7 for the particular status and fault conditions indicated by the two LED indicators.

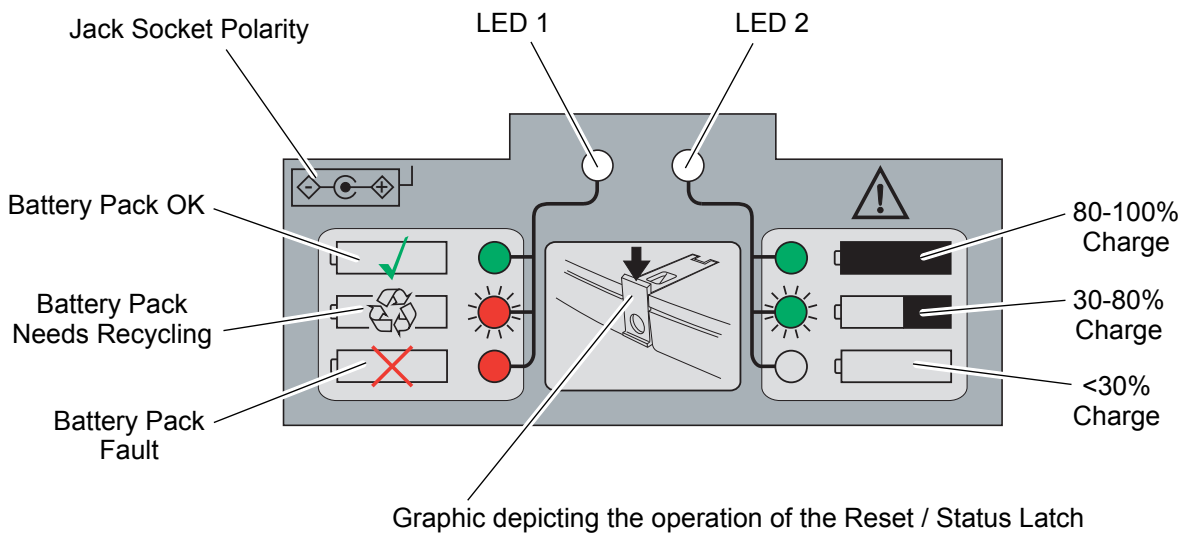


Figure 93 - Battery Pack Status Label

4 Battery Pack Storage

If the battery pack is to be put into long term storage it should be recharged at least once every 3-6 months.

5 Battery Pack Disposal

If the battery pack status indicates that it is faulty or needs recycling, then it should be returned to the ArjoHuntleigh Service Department to be recycled.

WARNING: DO NOT DISPOSE OF THE BATTERY PACK IN DOMESTIC WASTE.

6 Recharging the Battery Pack

Note: *It is normal for the battery pack and charger to get warm during use. Avoid recharging the battery pack near a source of heat or in direct sunlight.*

6.1 The battery pack is automatically recharged whenever it is installed on a pump which is connected to a mains/power supply.

6.2 Alternatively the battery pack can be recharged away from the pump by connecting it to the battery charger (Refer to Figure 94).

6.3 The approximate times to recharge the battery pack are as follows:

- Typical time = 5 hours.
- Maximum time = 8 hours.

Note: *These times apply to both methods of recharging.*

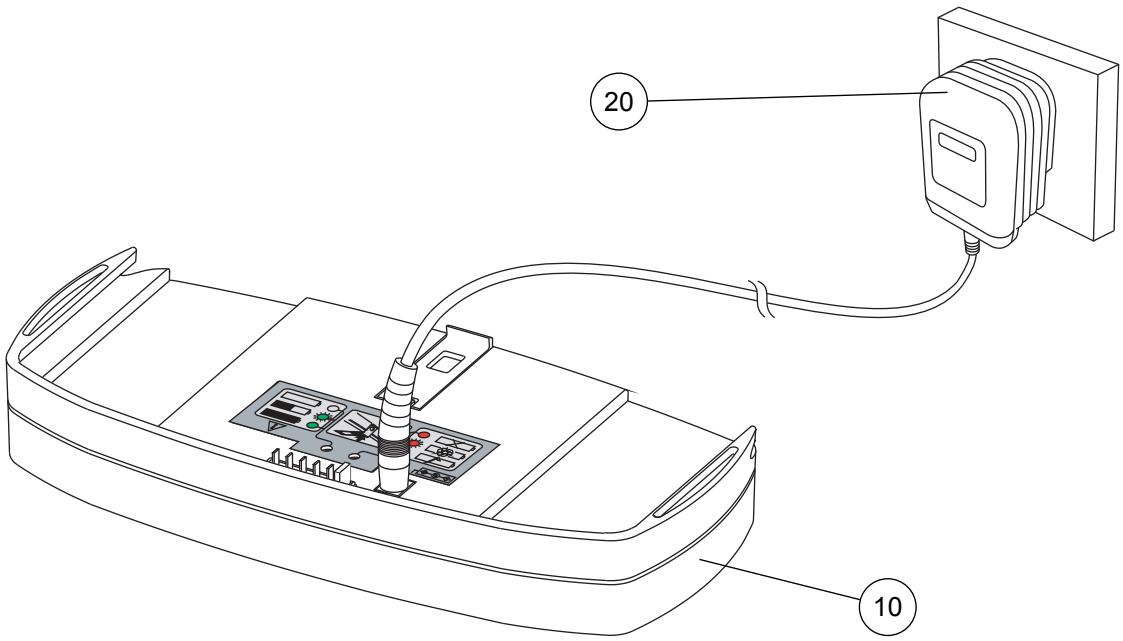


Figure 94 - Charging the Battery Pack using a Battery Charger

Table 54 - Battery Pack and Charger Parts List

Item	Part Number	Description	Qty
10	BBP600	Intelligent Battery Pack Assembly	1
20	639091	Battery Charger (USA)	1
	639090	Battery Charger (UK)	
	639092	Battery Charger (Euro)	

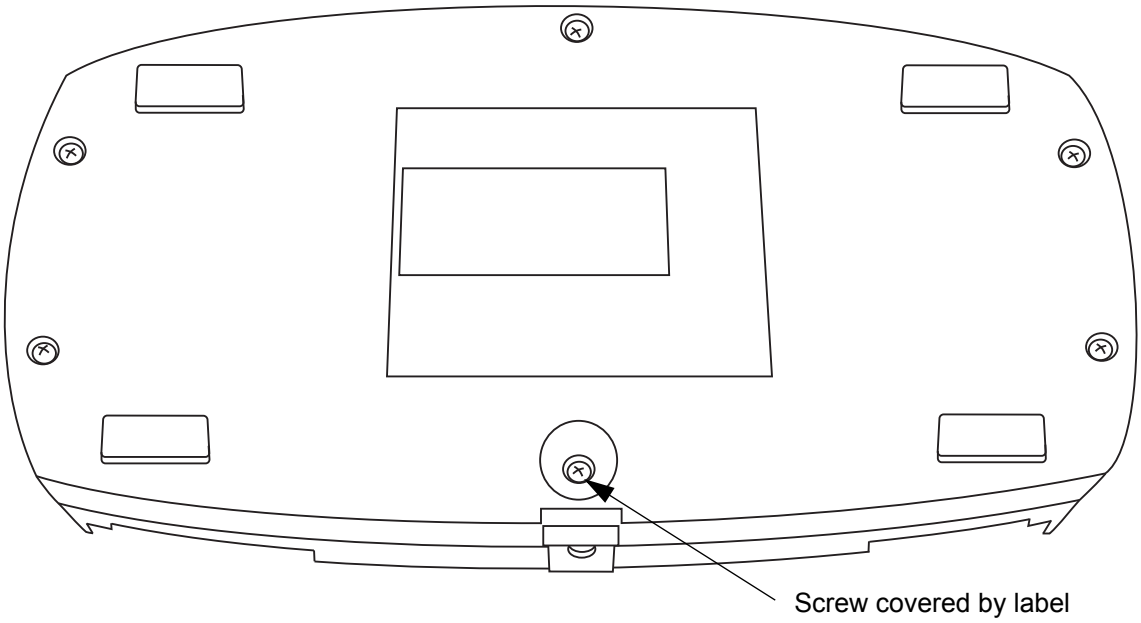


Figure 95 - Remove Battery Pack case screws

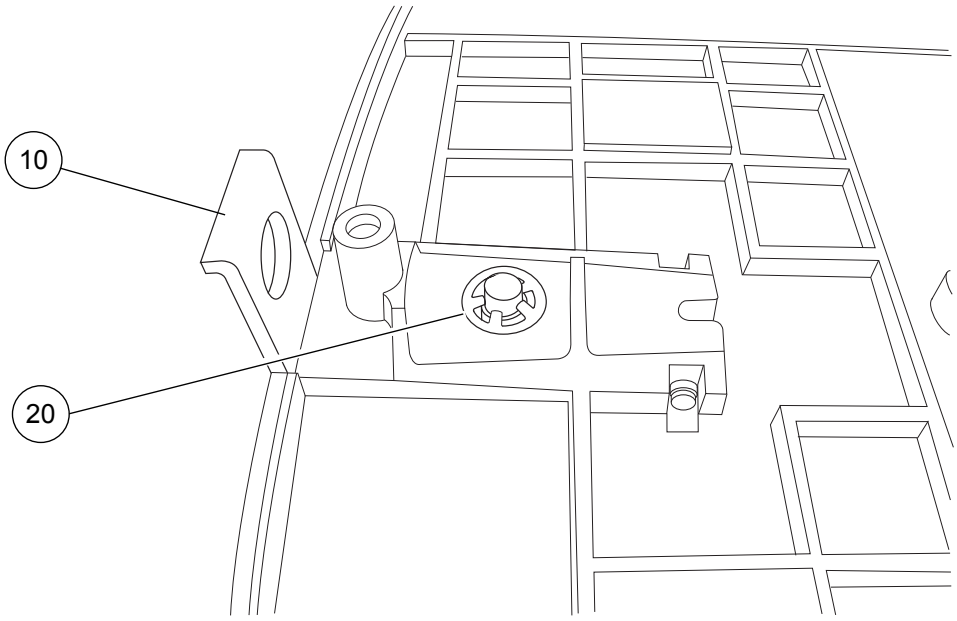


Figure 96 - Battery Pack - Reset/Status Latch and Starlock

Table 55 - Reset/Status Latch and Starlock Parts List

Item	Part Number	Description	Qty
10	507345	Battery Reset/Status Latch	1
20	SP-507506	Starlock, 4 mm ID, 10.1 mm OD	

7 Replacing the Battery Pack Reset/Status Latch

Note: *Battery Packs up to serial number BBP008253 are fitted with a replaceable latch. From serial number BBP010000 onwards, the latch design was improved but is no longer replaceable. Both old style and new style battery packs however are completely interchangeable.*

7.1 Place the battery pack face down on a clean, flat surface

7.2 Remove the six screws from the base of the battery pack.

Note: *The screw nearest the Reset/Status Latch is covered by a label.*

7.3 Place the battery pack face up and pull the two halves apart

7.4 Carefully remove the starlock SP-507506 and retain, or, if damaged, discard.

Note: *Take care when removing the starlock that it does not come into contact with the PCB.*

7.5 Remove the reset/status latch 507345 from the case.

7.6 Install the new reset/status latch into the case and secure in place with the starlock. Fit new starlock if necessary.

Note: *Make sure the starlock fits onto the seat of the reset/status latch spigot.*

7.7 Reassemble the battery pack. Secure the two halves together with the six screws.

7.8 After repair, test the battery pack: refer to Refer to Page 164, Section 8.

8 Testing the Battery Pack

8.1 The battery pack status label is on the top of the battery pack and has two LED indicators to show the status of, and diagnose faults in, the battery pack. Refer to Figure 164.

8.2 Check the battery pack status as follows:

8.2.1 Do **not** connect the ArjoHuntleigh charger to the battery pack.

8.2.1.1 Press the reset/status latch which will activate the two LEDs on the top of the battery pack.

8.2.1.2 Check the two LED indicators, refer to Figure 97. The two LEDs should display one of the conditions shown in Table 56.

8.2.2 Connect the ArjoHuntleigh charger to the battery pack.

8.2.2.1 Press the reset/status latch on the top of the battery pack.

8.2.2.2 Check the two LED indicators, as shown in Table 57. When the battery pack becomes fully charged both LED indicators change to the ON (green) condition.

8.3 Should the two LED indicators display a fault condition as shown in Table 58, then the battery pack is faulty and must be replaced.

.

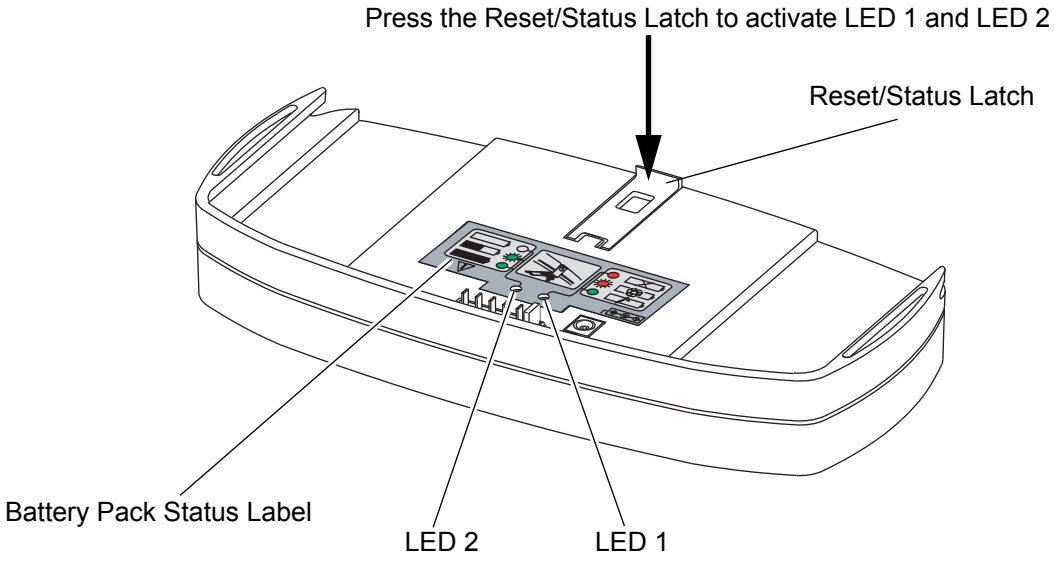


Figure 97 - Battery Pack

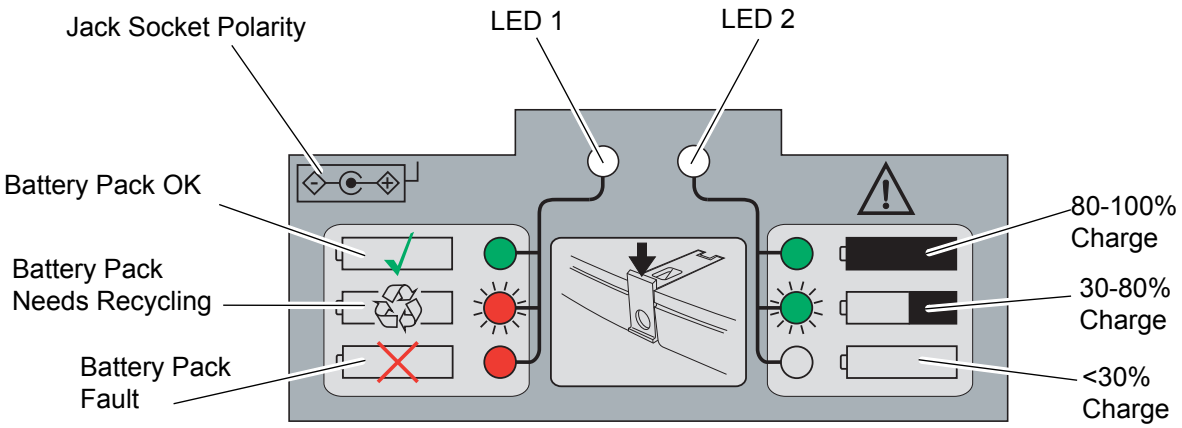


Figure 98 - Battery Pack Status Label

Table 56 - Battery Pack Status - Battery NOT on Charge

LED 1	LED 2	Battery Pack Status
Green	Green	Battery pack is OK. It has >80% charge.
Green	Green	Battery pack is OK. It has between 30-80% charge.
Green		Battery pack is OK. It has <30% charge.
		Battery pack is discharged.

Table 57 - Battery Pack Status - Battery on Charge

LED 1	LED 2	Battery Pack Status
Green	Green	Battery pack is OK. It is fully charged.
	Green	Battery pack is charging.

Table 58 - Battery Pack Status - Battery Failure/Error

LED 1	LED 2	Battery Pack Status
Red	Green	Battery pack needs recycling. It has between 30-80% charge.
Red		Battery pack needs recycling. It has <30% charge.
Red		Battery pack has an error. This could be temporary e.g. excessive temperature.
		Battery pack has an error (shown while charging).

CHAPTER 9

COMMUNICATOR SOFTWARE

1 General

1.1 The Communicator software sets up a Windows Graphical User Interface (GUI) on the computer which allows full user control of the pump.

1.2 The Communicator software (Table 59, Item 10) can only be installed on a Laptop PC or a Desktop PC which is running Microsoft® Windows XP.

Note: *Communicator software, Issue **03** or earlier, will not install correctly on XP Service Pack 2.*

1.3 On some PCs, new software can only be installed by someone with **Administrator** privileges.

Note: *Usually, only IT personnel have **Administrator** privileges. If this is the case, contact your IT department before attempting to install the software.*

Table 59 - Communicator Software Parts List

Item	Test Equipment	Part Number
10	Communicator Software, Issue **02** or higher	SERS001-**02**

2 Auto-Installing the Communicator Software

2.1 Before commencing installation, make sure that all other programs on the PC have been closed.

Note: *If other Windows applications are left running when installation is attempted, a warning message may appear and installation of Communicator is prevented until the relevant applications are closed and the warning message cleared.*

2.2 Insert the Communicator software CD ROM (Table 59, Item 10) into the CD ROM drive on the PC and close the CD ROM tray. The Communicator software should start to run.

2.3 After a few seconds, the **Setup Wizard** is displayed (Refer to Figure 99). Continue with the installation process (Para 2.6) below.

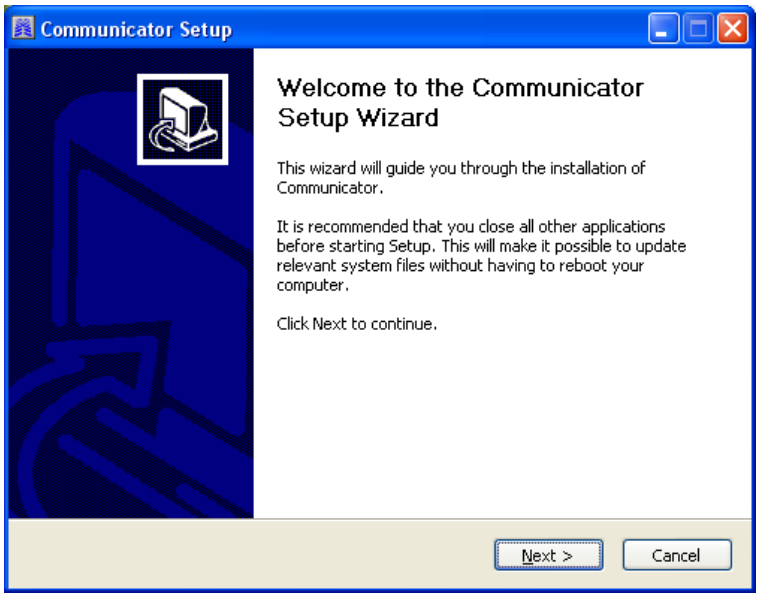

Communicator Setup
Welcome to the Communicator Setup Wizard
This wizard will guide you through the installation of Communicator.
It is recommended that you close all other applications before starting Setup. This will make it possible to update relevant system files without having to reboot your computer.
Click Next to continue.
Next >
Cancel

Figure 99 - Communicator Software - Setup Wizard

2.4 If after approximately 30 seconds, the **Setup Wizard** screen is not displayed and the activity LED indicator on the CD ROM drive is not flashing, then manually install the Communicator software (Refer to Page 171, Section 3).

2.5 If a **Log On as Administrator** (or similar) error message is displayed immediately the auto-installation process starts, then:

2.5.1 Remove the Communicator disc from the CD ROM drive.

2.5.2 Log off the PC.

2.5.3 Log back on as **Administrator**.

Note: *Usually, only IT personnel have **Administrator** privileges. If this is the case, contact your IT department.*

2.5.4 Re-start the auto-installation procedure at Para 2.2, above.

2.6 On the **Setup Wizard** screen (Refer to Figure 99) click **Next**. The **Choose Install Location** screen is displayed (Figure 100).

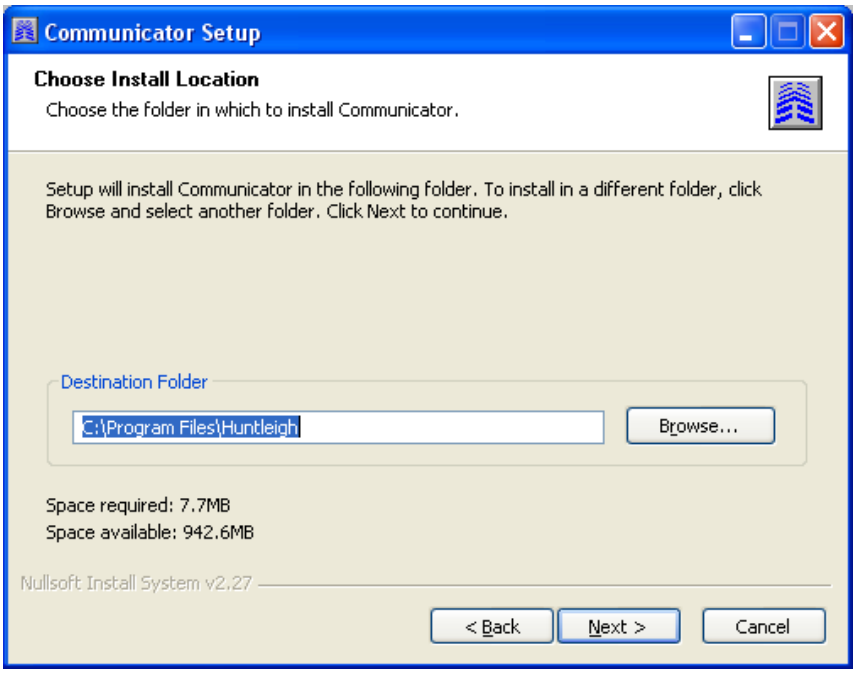

Communicator Setup
Choose Install Location
Choose the folder in which to install Communicator.
Setup will install Communicator in the following folder. To install in a different folder, click Browse and select another folder. Click Next to continue.
Destination Folder
C:\Program Files\Huntleigh
Browse...
Space required: 7.7MB
Space available: 942.6MB
Nullsoft Install System v2.27
< Back
Next >
Cancel

Figure 100 - Communicator Software - Choose Install Location

2.7 To install the program into the recommended default location, click **Next**. Alternatively, select a different location by clicking **Browse** and using the **Browse for Folder** pop-up window.

2.8 The **Choose Start Menu Folder** screen is displayed (Refer to Figure 101).

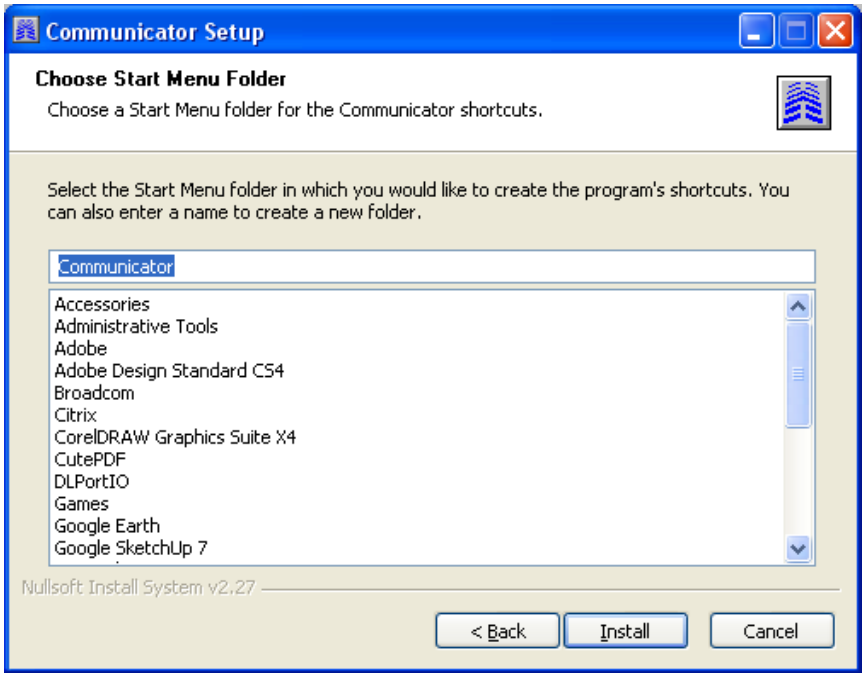


Figure 101 - Communicator Software - Start Menu Folder

2.9 Click **Install** to start the installation process using the suggested default folder. If required, an alternative folder name can be entered (Refer to Figure 101).

2.10 The **Installation** screen appears (Refer to Figure 102).

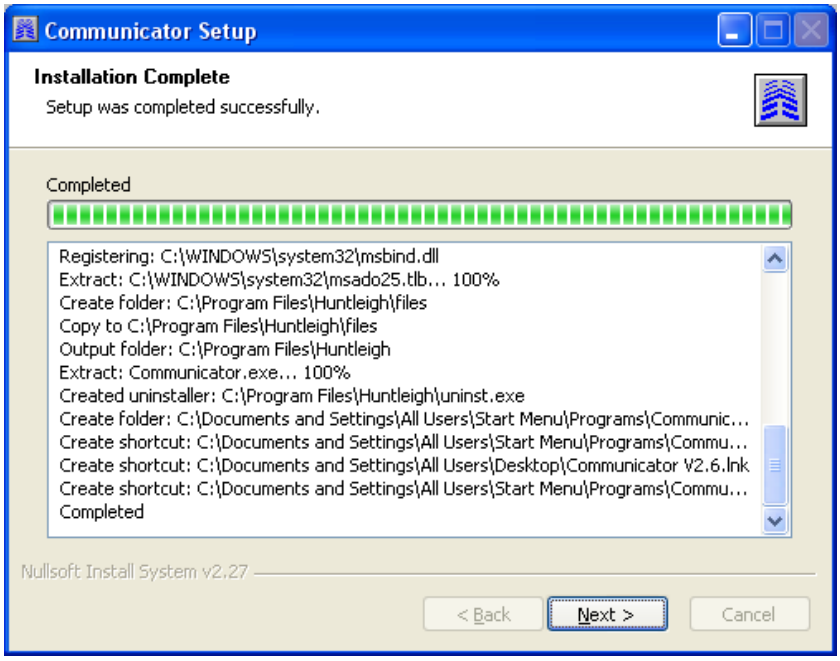


Figure 102 - Communicator Software - Installation

2.11 Installation of the program files begins, the progress bar showing the installation progress and the status field displaying the actions and the locations of the installed files (Refer to Figure 102). When complete, the message **Installation Complete** appears near the top of the screen. Click **Next** to continue.

2.12 The **Setup Wizard** screen reappears, displaying that setup is complete (Refer to Figure 103).

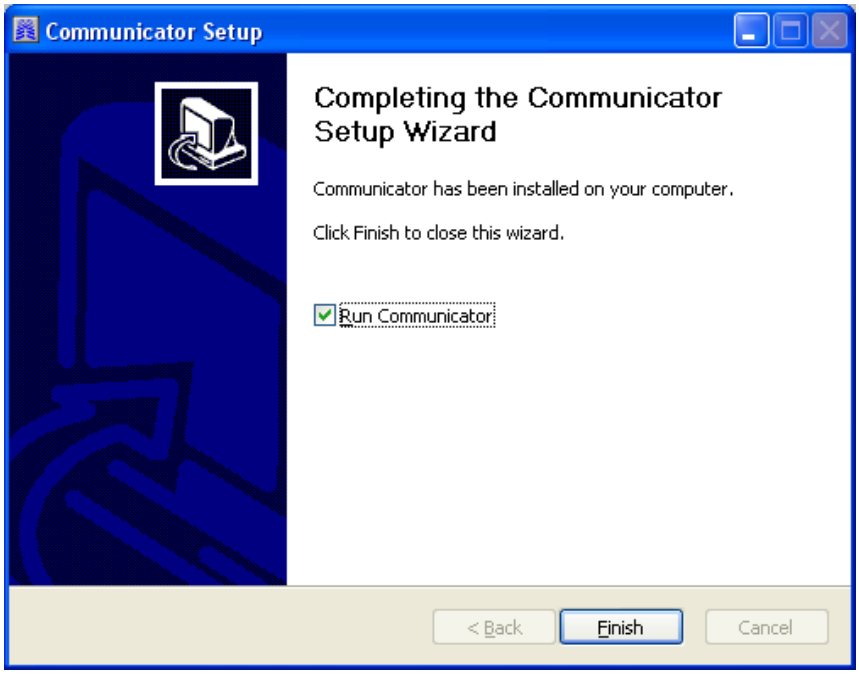


Figure 103 - Communicator Software - Setup Wizard Complete

2.13 Click **Finish** to close the Installation Wizard. Communicator will then automatically run.

3 Manually Installing the Communicator Software

3.1 Make sure that any other programs running on the PC have been closed.

3.2 Insert the Communicator software CD ROM (Table 59, Item 10) into the CD ROM drive on the PC, and close the CD ROM tray.

Note: *Wait a few seconds for the CD ROM disc to load.*

3.3 On the PC, click **Start** (Refer to Figure 104) then **Run**.

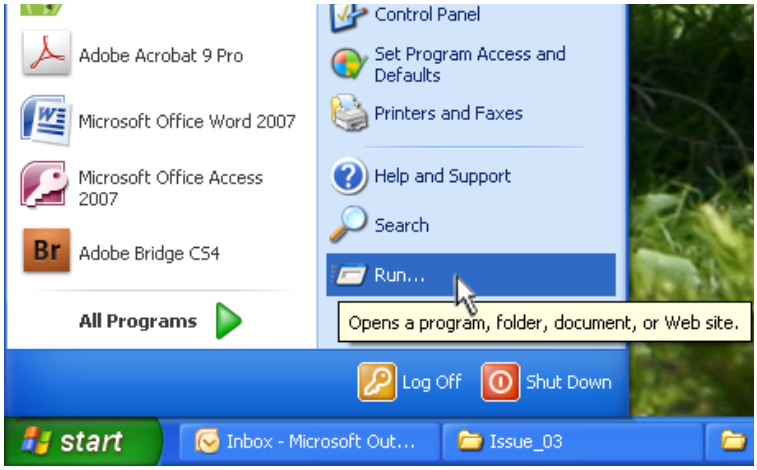


Figure 104 - PC - Start Menu

3.4 The **Run** dialog box is displayed (Refer to Figure 105).

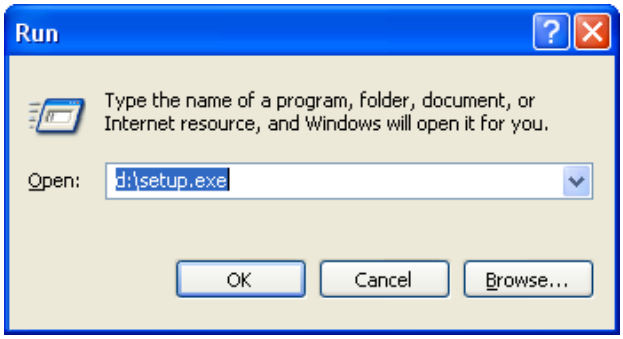


Figure 105 - PC - Run Dialog Box

3.5 To run the **Setup** file from the CD ROM, do the following:

3.5.1 Type **d:\setup.exe** (where **d:** is the PC's CD ROM drive).

Note: *Some PC CD ROMs may be assigned different drive letters. The drive letter can be found by clicking on* ***Start*** *then* ***My Computer.***

3.5.2 Click **OK**.

3.5.3 Alternatively click **Browse** to manually search for the **setup.exe** file on the CD ROM.

3.6 The Communicator software will start to install from the CD ROM.

3.7 After a few seconds, the **Setup Wizard** screen should be displayed (Refer to Figure 99). Continue with the installation process (Refer to Page 169, Section 2.6).

4 Running the Communicator Software

Confirm that the Communicator software has been installed correctly by running it.

4.1 Double-click the **Communicator** icon on the PC desktop.The program will start to run (Refer to Chapter 4 “Testing”, Page 49, Section 6).

4.2 If the **Communicator** icon is not on the PC desktop (Refer to Figure 106):

4.2.1 Click **Start**.

4.2.2 Select **All Programs**.

4.2.3 Select **Communicator**.

4.2.4 Click **Communicator v2.6** (or other installed version).

4.2.5 The program starts (Refer to Chapter 4 “Testing”, Page 49, Section 6).

Note: *This is the default location of the Communicator Software. If alternative groups or locations were specified during installation, look in those locations.*

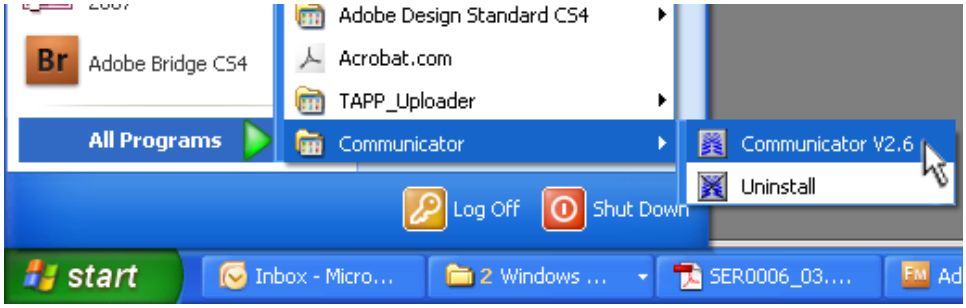


Figure 106 - Running the Communicator Software

CHAPTER 10

TECHNICAL SPECIFICATION

PUMP		
Model:	Auto Logic	
Part Numbers:	630001	UK
	630003	USA
	630004BE (630EUR)	Belgium
	630004DE (630EUR)	Germany
	630004DK (630EUR)	Denmark
	630004ES (630EUR)	Spain
	630004FR (630EUR)	France
	630004IT (630EUR)	Italy
	630004NL (630EUR)	Netherlands
	630004SV (630EUR)	Sweden
	630009AU	Australia
	630UNI	Universal
Model:	Auto Logic Autofirm	
Part Numbers:	654001	UK
	654004DK (654EUR)	Denmark
Supply Voltage:	100 - 230 VAC	
Supply Frequency:	50 - 60Hz	
Power Input:	28 - 68 VA	
Size:	375 x 280 x 125 mm (14.8 x 11.0 x 4.9”)	
Weight:	2.75 kg (6.05 lbs)	
Case Material:	ABS Plastic	
Plug Fuse Rating:	5A to BS1362 (UK only)	
Pump Fuse Rating:	T3.15A (Internal)	
Degree of protection against electric shock:	Mains Connected - Class II, Double Insulated with Functional Earth Type BF No Mains Connected - Internally Powered	
Degree of protection against liquid ingress:	IPX0 - No protection	
Mode of operation:	Continuous	
Cycle Time:	10 minutes	

PUMP SYMBOLS

	The operator must read this document (Instructions for Use) before use. Note: This symbol is blue on the product label.		Battery Low Indicator		Do not dispose of in domestic refuse
25EA CAN/CSA-C22.2 No 60601-1 (2008)	With respect to electric shock, fire and mechanical hazards only in accordance with CAN/CSA-C22.2 No. 60601.1 (2008). MEDICAL EQUIPMENT		Run/Standby. Note: Unit is not isolated from mains supply.		Type BF
	Refer to this document (Instructions for Use) for a description of the product classification (3rd Edition).	**SN:**	Serial Number	**Ref:**	Model number
	Refer to this document (Instructions for Use) for a description of the product classification (2nd Edition).		Manufacturer: This symbol is accompanied by the name and the address of the manufacturer.		Double Insulated

ENVIRONMENTAL INFORMATION

Condition	Temperature Range	Relative Humidity	Atmospheric Pressure
Operating	+10°C to +40°C (+50°F to +104°F)	30% to 75% (non-condensing)	700hPa to 1060 hPa
Storage (Long Term)	+10°C to +40°C (+50°F to +104°F)	20% to 95% (non-condensing)	700 hPa to 1060 hPa
Storage (Short Term)	-20°C to +50°C (-4°F to +122°F)	20% to 95% (non-condensing)	500 hPa to 1060 hPa

\+ *If the pump is stored in conditions outside the "Operating" ranges, allow time for its temperature to stabilise to normal, before use.*

ACCESSORIES

Part:	Battery Pack
Part Number:	BBP600
Size:	242 mm x 118 mm x 37 mm
Weight:	0.8kg
Electrical Rating:	13.8V dc ⎓ 4Ah (NiMh)
Symbols	
	Do not dispose of in domestic refuse (Return it to the ArjoHuntleigh Service Department to be recycled.)
	Recycle

MATTRESS

Description	Cell Material	*Foam underlay size **Air-filled sub-mattress size	Base Pad Material
Auto Logic 110	Polyurethane	NA	NA
Auto Logic 175	Polyurethane	*2032 x 838 x 63.5mm (80" x 33" x 2.5")	PU Laminate
Auto Logic 200	Polyurethane	**2030 x 860 x 90mm (80" x 34" x 3.5")	PU Laminate

MATTRESS SIZE INFORMATION

Part No.	Description	Spare Cover	Length mm	Width mm	Height mm
PXA001ADV	AUTO Logic 110 (Advantex)	PXA082	2030 (80")	860 (34")	115 (4.5")
PXA001DAR	AUTO Logic 110 (Dartex)	PXA080	2030 (80")	860 (34")	115 (4.5")
PXA001EVE	AUTO Logic 110 (eVENT)	PXA084	2030 (80")	860 (34")	115 (4.5")
PXA201ADV	AUTO Logic 110 Narrow (Advantex)	PXA282	2030 (80")	780 (30")	115 (4.5")
PXA201DAR	AUTO Logic 110 Narrow (Dartex)	PXA280	2030 (80")	780 (30")	115 (4.5")
PXA201EVE	AUTO Logic 110 Narrow (eVENT)	PXA284	2030 (80")	780 (30")	115 (4.5")
PXB005ADV	AUTO Logic 175 (Advantex)	PXB182	2030 (80")	860 (34")	175 (7")
PXB005DAR	AUTO Logic 175 (Dartex)	PXB180	2030 (80")	860 (34")	175 (7")
PXB005EVE	AUTO Logic 175 (eVENT)	PXB184	2030 (80")	860 (34")	175 (7")
PXB001ADV	AUTO Logic 200 (Advantex)	PXB082	2030 (80")	860 (34")	205 (8")
PXB001DAR	AUTO Logic 200 (Dartex)	PXB080	2030 (80")	860 (34")	205 (8")
PXB001EVE	AUTO Logic 200 (eVENT)	PXB084	2030 (80")	860 (34")	205 (8")
PXB201ADV	AUTO Logic 200 Narrow (Advantex)	PXB282	2030 (80")	780 (30")	205 (8")
PXB201DAR	AUTO Logic 200 Narrow (Dartex)	PXB280	2030 (80")	780 (30")	205 (8")
PXB201EVE	AUTO Logic 200 Narrow (eVENT)	PXB284	2030 (80")	780 (30")	205 (8")

SEAT	
Aura Logic Seat Cushion	**PXS001**
Length:	470mm
Width:	455mm
Height:	50mm
Cell Material:	Polyurethane

CLEANING SYMBOLS			
	Wash at 71°C (160°F) for a minimum of 3 minutes		Tumble dry at 80-85°C.
	Wash at 95°C (203°F) MAX		Tumble dry at 130°C
	Wash at 65°C (149°F) for a minimum of 10 minutes		Wipe surface with damp cloth
	Do not iron		Use solution diluted to 1000 ppm of Available Chlorine
	Do Not Use Phenol-based cleaning Solutions		

COVER SPECIFICATION			
Feature	**Standard Cover (Dartex)®**	**Advantex®**	**eVENT® Fabric[a]**
Removable Cover	Yes	Yes	Yes
Moisture Vapour Permeable	Yes	Yes	12 times higher
Air Permeable	No	No	Yes
Low Friction	Yes	18% lower	20% lower
Water Resistant / Repellent	Yes	Yes	Yes
Infection Control	Material coating is Bacteriostatic, fungistatic, antimicrobial	Material coating is Bacteriostatic, fungistatic, antimicrobial	INERT MATERIAL does not support bacterial growth
Fire Retardant	BS 7175: 0,1 & 5	BS 7175: 0,1 & 5	BS EN ISO 12952-1 **ONLY** [a]
2-Way Stretch	Yes	Some	No
Washing Conditions	MAX 95°C (203°F)[b]	MAX 95°C (203°F)[b]	71°C for 3 minutes or 65°C for 10 minutes
Drying Conditions	Tumble Dry up to 130°C (266°F) or Air Dry[c]	Tumble Dry **ONLY** at 80-85°C (176°F-185°F)[d]	Tumble Dry up to 130°C (266°F) or Air Dry[c]
Life Span	50 Wash Cycles (minimum)	50 Wash Cycles (minimum)	15 Wash Cycles[e]
Application Area	Acute and Homecare	Acute and Homecare	Acute **ONLY** [a]

a. Due to the inherently lower flame retardancy of the high performance eVENT® fabric, it is NOT suitable for use in the homecare environment.

b. The top cover may be washed. The temperature in the washing cycle may be up to 95°C (203°F); however it is recommended that you check your local policy to determine the time/ temperature ratio required to achieve thermal disinfection.

c. The top cover may be tumble dried or air dried. The temperature in the drying cycle may be up to 130°C (266°F); however it is recommended that you check your local policy to determine the time/temperature ratio required.

d. The top cover should be tumble dried only at a temperature of 80-85°C (176-185°F); however it is recommended that you check your local policy to determine the time/ temperature ratio required.

e. The life span of the eVENT cover is significantly lower due to the inherent nature of the eVENT material.

Guidance and manufacturer's declaration - electromagnetic emissions

The pump is intended for use in the electromagnetic environment specified below. The customer or the user of the pump should assure that it is used in such an environment.

Emissions Test	Compliance	Electromagnetic environment - guidance
RF emissions CISPR - 11	Group 1	uses RF energy only for its internal function. therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR - 11	Class A	The pump is suitable for use in all establishments other than domestic and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions	Class A	
Voltage fluctuations/ flicker emissions IEC 61000-3-2	Complies	

Recommended separation distances between portable and mobile RF communications equipment and the pump

The pump is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the pump can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the pump as recommended below, according to the maximum output power of the communications equipment.

Rated maximum output power of transmitter W	**Separation distance according to frequency of transmitter** m		
	150 kHz to 80 MHz $d = 1.2\sqrt{P}$	**80 MHz to 800 MHz** $d = 1.2\sqrt{P}$	**800 MHz to 2.5 GHz** $d = 2.3\sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1	1.2	1.2	2.3
10	2.8	3.8	7.3
100	12	12	23

For transmitters rated at a maximum output power not listed above, the recommended separation distance *d* in metres (m) can be estimated using the equation applicable to the frequency of the transmitter, where *P* is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

Note: *At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.*

Note: *These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.*

Guidance and manufacturer's declaration - electromagnetic immunity

The pump is intended for use in the electromagnetic environment specified below. The customer or the user of the pump should assure that it is used in such an environment.

Immunity Test	IEC 60601 Test Level	Compliance Level	Electromagnetic environment - guidance
			Portable and mobile RF communications equipment should be used no closer to any part of the pump, including cables, that the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. **Recommended separation distance**
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz	3 V	$d = 1.2\sqrt{P}$ $d = 1.2\sqrt{P}$ 80 MHz to 800 MHz
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2.5GHz	3 V/m	$d = 2.3\sqrt{P}$ 800 MHz to 2.5 GHz where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in metres (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey [a], should be less than the compliance level in each frequency range.[b] Interference may occur in the vicinity of equipment marked with the following symbol:

Note: *At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.*

Note: *These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.*

[a] Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the pump is used exceeds the applicable RF compliance level above, the pump should be observed to verify normal operation. If abnormal operation is observed, additional measures may be necessary, such as reorientating or relocating the pump.

[b] Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.

CHAPTER 11
PARTS LIST

1 General

On the left side of the **Description** column in the main parts list, the inclusion of none, one or two leading "bullets" is used to indicate the different levels of assembly and sub-assembly, as detailed below.

Symbol		Assembly Level	Example
	(Blank)	Level 1 or Top Assembly	Front Case
•	(Single Bullet)	Level 2 or Sub-Assembly	• Power Supply PCB Assembly
• •	(Double Bullet)	Level 3 or Sub-Sub-Assembly	• • Fuse, 3.15A 20mm Type T

2 Overall Assembly Parts List

Part Number	Description	Fig - Item	Qty
Auto Logic Pump General Assembly			
630001	Auto Logic Pump, UK	-	-
630003	Auto Logic Pump, USA	-	-
630004BE (630EUR)	Auto Logic Pump - Belgium	-	-
630004DE (630EUR)	Auto Logic Pump - Germany	-	-
630004DK (630EUR)	Auto Logic Pump - Denmark	-	-
630004ES (630EUR)	Auto Logic Pump - Spain	-	-
630004FR (630EUR)	Auto Logic Pump - France	-	-
630004IT (630EUR)	Auto Logic Pump - Italy	-	-
630004NL (630EUR)	Auto Logic Pump - Netherlands	-	-
630004SV (630EUR)	Auto Logic Pump - Sweden	-	-
630009AU	Auto Logic Pump - Australia	-	-
630UNI	Auto Logic Pump	-	-
		-	-

Part Number	Description	Fig - Item	Qty
Auto Logic 110 Mattress Overlay General Assembly			
PXA001DAR	Auto Logic 110 Mattress Overlay, Dartex Cover (Standard)	-	-
PXA001ADV	Auto Logic 110 Mattress Overlay, Advantex Cover	-	-
PXA001EVE	Auto Logic 110 Mattress Overlay, eVENT Cover	-	-
Auto Logic 110 Mattress (Narrow) Overlay General Assembly			
PXA201DAR	Auto Logic 110 Mattress Overlay, Narrow, Dartex Cover (Std)		
PXA201ADV	Auto Logic 110 Mattress Overlay, Narrow, Advantex Cover		
PXA201EVE	Auto Logic 110 Mattress Overlay, Narrow, eVENT Cover		
Auto Logic 175 Mattress Overlay General Assembly			
PXB005DAR	Auto Logic 175 Mattress Overlay, Dartex Cover (Standard)	-	-
PXB005ADV	Auto Logic 175 Mattress Overlay, Advantex Cover	-	-
PXB005EVE	Auto Logic 175 Mattress Overlay, eVENT Cover	-	-
Auto Logic 200 Mattress Replacement General Assembly, comprises: Mattress Overlay and Mattress Base Pad			
PXB001DAR	Auto Logic 200 Dartex Cover (Standard)	-	-
PXB001ADV	Auto Logic 200 Advantex Cover	-	-
PXB001EVE	Auto Logic 200 eVENT Cover	-	-
Auto Logic 200 Mattress Replacement (Narrow) General Assembly comprises: Mattress Overlay (Narrow) and Mattress Base Pad (Narrow)			
PXB201DAR	Auto Logic 200 Narrow, Dartex Cover (Standard)	-	-
PXB201ADV	Auto Logic 200 Narrow, Advantex Cover	-	-
PXB201EVE	Auto Logic 200 Narrow, eVENT Cover	-	-
Aura Logic Seat Cushion General Assembly			
PXS001	Aura Logic Seat Cushion	89-10	1
Intelligent Battery Pack Assembly			
BBP600	Intelligent Battery Pack	92-10	1

Part Number	Description	Fig - Item	Qty
Patient Handset			
630403	Patient Handset (No longer available)		-

3 Pump Assembly Parts List

Part Number	Description	Fig - Item	Qty
Front Case Assembly			
630320	Front Case (Old Style - Moulding only)	62-10 63-10 64-10	1
630570	Front Case (New Style - Moulding only)	65-10 66-10 67-10	1
630100	• Manifold Assembly (including RFID Coil Antenna), Spares Item	42-10 46-10	1
630055	• • RFID Coil Antenna, Long	46-20	1
BP196	• • Cable Tie	46-30	1
630364	• • O-Ring, 6.8mm dia	48-10	3
509051	• Compressor Assembly, Series 6, 5.5V 50/60Hz	42-70 49-10 50-10 52-10	1
509317	• • Air Inlet Filter, Compressor Assembly	57-30	1
509320	• • Air Inlet Filter Holder	57-40	1
507316	• • Compressor Mounting Bracket	49-20 50-20	1
FAS218	• • Screw, 4mm dia x 12 Pan Head	49-30	2
507380	• • Compressor Bracket Grommet	50-30	2
507317	• • Compressor Bump Stop	50-40	2
FAS223	• • Screw, 3 dia x 10 Pan Head	50-50	2
630335	• • Elbow	50-60 52-20	1
630400	• Control PCB (superseded by 630140 from serial number 0900058473 onwards)	42-40 54-10	1
630140	• Control PCB	55-30	
654140	• Control PCB (Autofirm model only)	58-30	
151457	• • Rechargeable Battery, Spares Item (not for 630140)	55-10	1
630600	• • 4.8V 70mAh Battery, Spares Item		
BP196	• • Cable Tie	55-20	1

Part Number	Description	Fig - Item	Qty
FAS145	• • Screw, 3 dia x 8 Pan Head	53-20	4
507058	• Power Supply PCB (superseded by 507137)	42-80	1
507137	• Power Supply PCB (Printed Circuit Board) Assembly	49-40 53-10 57-20	
507422	• • Fuse, 3.15A 20mm Type T	57-10	2
FAS223	• • Screw, 3 dia x 10 Pan Head	53-20	6
LAB392	• Membrane Label, Blue, Iconised (without Autofirm button)	58-10	1
LAB402	• Membrane Label, Blue, Iconised (with Autofirm button)		
630328	• LCD Window Cover	58-20 64-20	1
630098	• Silencer Bag Assembly	42-50	1
630334	• Tube, Compressor Assembly - Silencer Bag Assembly	42-60 50-70 52-30	1
630349	• Tube, Manifold Assembly - Silencer Bag Assembly	42-30	1
REF	• Tube, Manifold Assembly - Control PCB Transducer	42-20	1
630318	• PCB Mounting Pillar	53-30 54-40	4
FAS223	• • Screw, 3 dia x 10 Pan Head	54-30	4
507410	• Connector Sealing Strip	53-40	2
507413	• Rubber Foot	40-40 62-40	2
630373	• Noise-Reduction Foam, Front Case	62-20	1
BP027	• Compressor Support Rubber	62-30	2
BP042	• Ferrite Magnet	63-50	1
507386	• • Magnet Mounting Pad	63-60	1
507410	• Connector Sealing Strip	63-70	1
630399	• Case Strengthening Strip, Self-Adhesive	62-80	1
630324	• IrDA LED Lens	64-30	1
630327	• Grommet, Patient Handset	64-40	1
630319	• Battery Socket Cover	64-50	1
630398	• Pump Label, Auto Logic (old style front case)	64-60	1
PKG830	• Pump Gel Pad Label, ArjoHuntleigh (new style front case)	67-40	1

Part Number	Description	Fig - Item	Qty
Rear Case Assembly			
630321	Rear Case (Old Style - Moulding only)	40-10 61-10	1
630571	Rear Case (New Style - Moulding only)	40-10 71-10	1
630415	• Mains/Power Cordset, 6m Coiled (UK)	39-10	1
630416	• Mains/Power Cordset, 6m Coiled (Euro)	39-10	1
630417	• Mains/Power Cordset, 6m Coiled (USA)	39-10	1
630329	• IEC Connector Cover	39-20	1
FAS223	• • Screw, 3 dia x 10 Pan Head	39-30	2
BP044	• • Pad	39-40	1
630326	• Filter Cover	39-60	1
507374	• • Air Inlet Filter Felt	39-50	1
FAS145	• • Screw, 3 dia x 8 Pan Head	39-70	1
630315	• Hook	41-10	2
630325	• • Hook Cover	41-20	2
FAS225	• • Screw, 3 dia x 16 Pan Head	41-30	8
FAS225	• Screw, 3 dia x 16 Pan Head	40-30	5
507413	• Rubber Foot	40-40 60-20	6
630330	• Handle Insert	60-30	1
630383	• Noise-Reduction Foam, Rear Case	61-40	1
BP027	• Compressor Support Rubber	61-50	2
Pump Label Sets			
LAB314	Pump Rear Label - serial numbers earlier than 1200028327	56-10	
LAB705	Pump Rear Label - serial numbers 1200028327 - current		

4 Mattress Overlay Assembly Parts List

Part Number	Description	Fig - Item	Qty
Top Cover Assembly Auto Logic 110 Mattress Overlay			
PXA080	Top Cover Assembly, Dartex (Standard)	-	1
PXA082	Top Cover Assembly, Advantex	-	1
PXA084	Top Cover Assembly, eVENT	-	1
Top Cover Assembly Auto Logic 110 Mattress Overlay - Narrow			
PXA280	Top Cover Assembly, Dartex (Standard) - Narrow		
PXA282	Top Cover Assembly, Advantex - Narrow		
PXA284	Top Cover Assembly, eVENT - Narrow		
Top Cover Assembly Auto Logic 175 Mattress Overlay			
PXB180	Top Cover Assembly, Dartex (Standard)		
PXB182	Top Cover Assembly, Advantex		
PXB184	Top Cover Assembly, eVENT		
Top Cover Assembly Auto Logic 200 Mattress Replacement			
PXB080	Top Cover Assembly, Dartex (Standard)		
PXB082	Top Cover Assembly, Advantex		
PXB084	Top Cover Assembly, eVENT		
Top Cover Assembly Auto Logic 200 Mattress Replacement - Narrow			
PXB280	Top Cover Assembly, Dartex (Standard) - Narrow	-	1
PXB282	Top Cover Assembly, Advantex - Narrow	-	1
PXB284	Top Cover Assembly, eVENT - Narrow	-	1
Cell Assemblies			
PXA050	Cell Assembly, Torso (Cell-in-Cell)	74-10	10
PXA060	Cell Assembly, Standard	74-20	10
Base Sheet Assembly			
PXA170	Base Sheet Assembly, for Mattress Overlay only	87-10	1
PXB170	Base Sheet Assembly, for Mattress Replacement only	-	1

Part Number	Description	Fig - Item	Qty
PXA290	Base Sheet Assembly (Narrow), for Mattress Overlay Auto Logic 110	87-10	1
PXB290	Base Sheet Assembly (Narrow), for Mattress Overlay Auto Logic 200	-	1
PXA090	• Manifold Tube Assembly	78-10	1
PXA335	• • Partial Non-Return Valve Assembly	80-10	2
627389	• • Non-Return Valve	80-20	1
PXA059	• • Tube Assembly, Low Air Loss Patch	78-20 80-30	1
PXA700	• Pump Tubeset Assembly	84-10	1
PXA056	• CPR Assembly	84-20	1
PXA074	• Manifold Connector Assembly, Mattress Overlay	84-30	1
PXA073	• Retaining Strap Assembly, Pair	84-40	4
Press Stud Replacement			
MIS143	Hand Press Tool	88-10	1
MIS142	Die Set (for Hand Press Tool)	88-20	1
FAS169	Stud Post, Schaeffer Plastic	88-30	A/R
FAS170	Stud Cap, Schaeffer Plastic	88-40	A/R
FAS171	Stud Socket, Schaeffer Plastic	88-50	A/R

5 Mattress Base Pad Assembly Parts List

Part Number	Description	Fig - Item	Qty
Base Pad Sub-Assembly			
PXB055	Base Pad Sub-Assembly	87-10	1
PXB255	Base Pad Sub-Assembly (Narrow)	87-10	1
PXB307	• Manifold Connector Assembly, Mattress Base Pad	85-10 86-10	1
PXA358	• • Draw Latch	85-20 86-20	2
PXA359	• • Screw, 2.5mm dia x 10mm Csk Head	86-30	4
PXB073	• Retaining Strap Assembly	87-20	8
Press Stud Replacement			
MIS143	Hand Press Tool	88-10	1
MIS142	Die Set (for Hand Press Tool)	88-20	1
FAS169	Stud Post, Schaeffer Plastic	88-30	A/R
FAS170	Stud Cap, Schaeffer Plastic	88-40	A/R
FAS171	Stud Socket, Schaeffer Plastic	88-50	A/R

6 Seat Cushion Assembly Parts List

Part Number	Description	Fig - Item	Qty
Top Cover Assembly			
PXS062	• Top Cover Assembly	89-20	1
Seat Cushion Assembly			
PXS059	• Base Assembly	90-10	1
PXS056	• Cell Assembly, Welded	90-20	1
403305	• • Connector, Elbow	90-30	11
PXS302	• • Connector, Straight	90-40	1
401300	• • T-Connector	90-50	2
PXS309	• • Connector, Stepped	90-60	2
PXS067	• • Tube Assembly, Internal	90-70	1
PXS700	• Pump Tubeset Assembly	90-80	1
PXS066	• Retaining Strap Assembly, Pair	91-10	2

7 Intelligent Battery Pack Assembly

Part Number	Description	Fig - Item	Qty
Battery Pack Assembly			
BBP600	Intelligent Battery Pack Assembly	92-10 94-10	1
Battery Charger			
639090	Battery Charger (UK)	94-20	1
639091	Battery Charger (USA)	94-20	1
639092	Battery Charger (Euro)	94-20	1

8 Test Equipment

Part Number	Description	Fig - Item	Qty
Pump Flow, Pressure and Function Test Equipment			
MIS216	IR Interface Module	-	-
507104	Serial Communications Pack	-	-
-	Laptop / Desktop PC running Microsoft® Windows XP	-	-
PRE073	Flow / Pressure Rig, 3-26 ltr/min	-	-
630105	3-way Pump Tubeset Adaptor (Spares Item)	-	-
SERS001-**02**	Communicator Software, Version **02** or higher	-	-
Electrical Safety Test Equipment			
-	Insulation Resistance Tester (Megger), 500 Vdc	-	-
-	Portable Appliance Tester	-	-
-	Dielectric Strength Tester (Flash Tester), 3.0 kVac	-	-
Mattress Replacement, Overlay and Seat Cushion Inflation Test Equipment			
PRE073	Flow / Pressure Rig, 3-26 ltr/min	-	-
-	Portable Inflation Test Unit	-	-
-	Stopwatch	-	-

CHAPTER 12

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